Gas Journal

LIGHT - HEAT - POWER - BY-PRODUCTS

Vol. 245. 97th Year. LONDON, MARCH 14, 1945. No. 4269. Price 1/-

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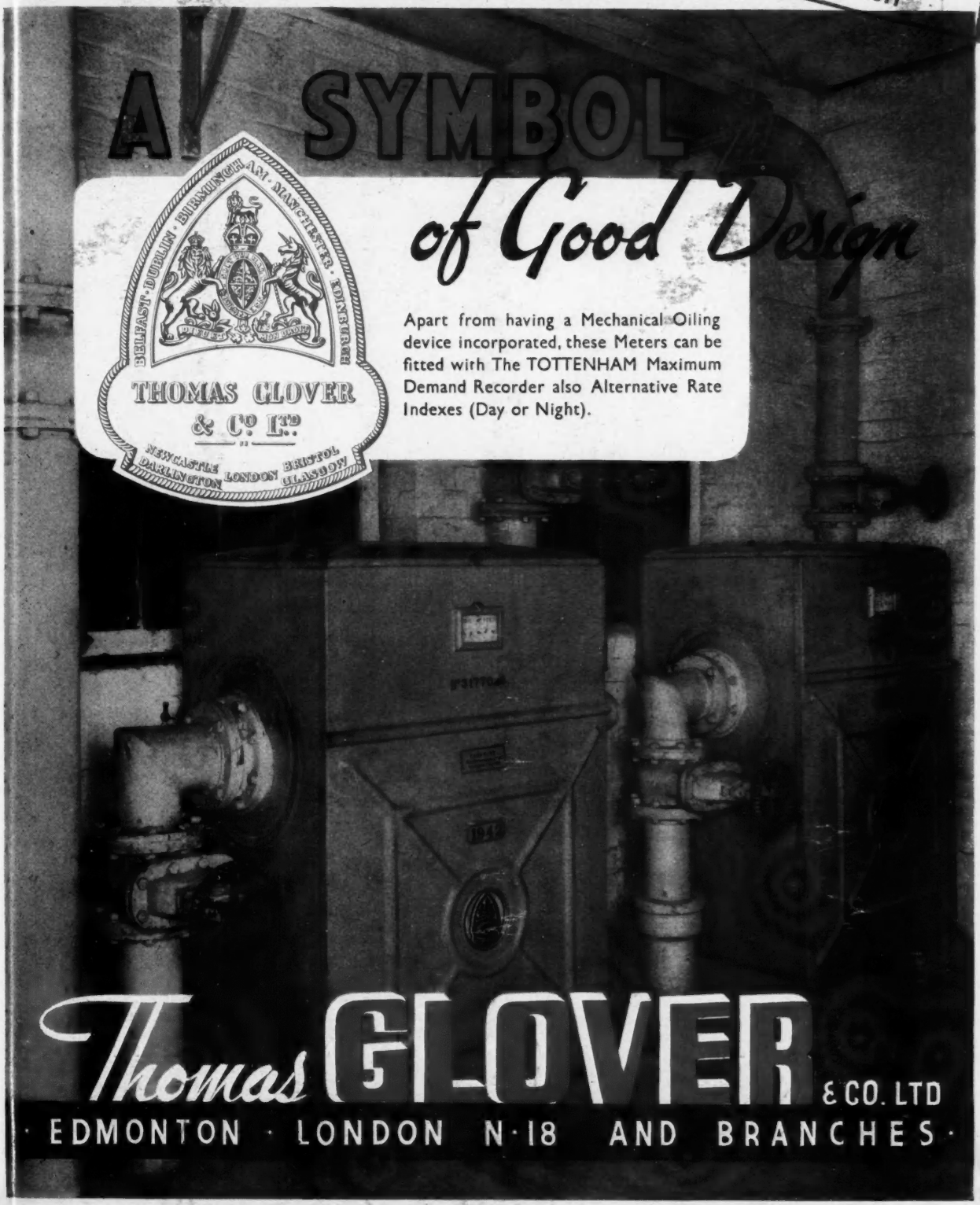
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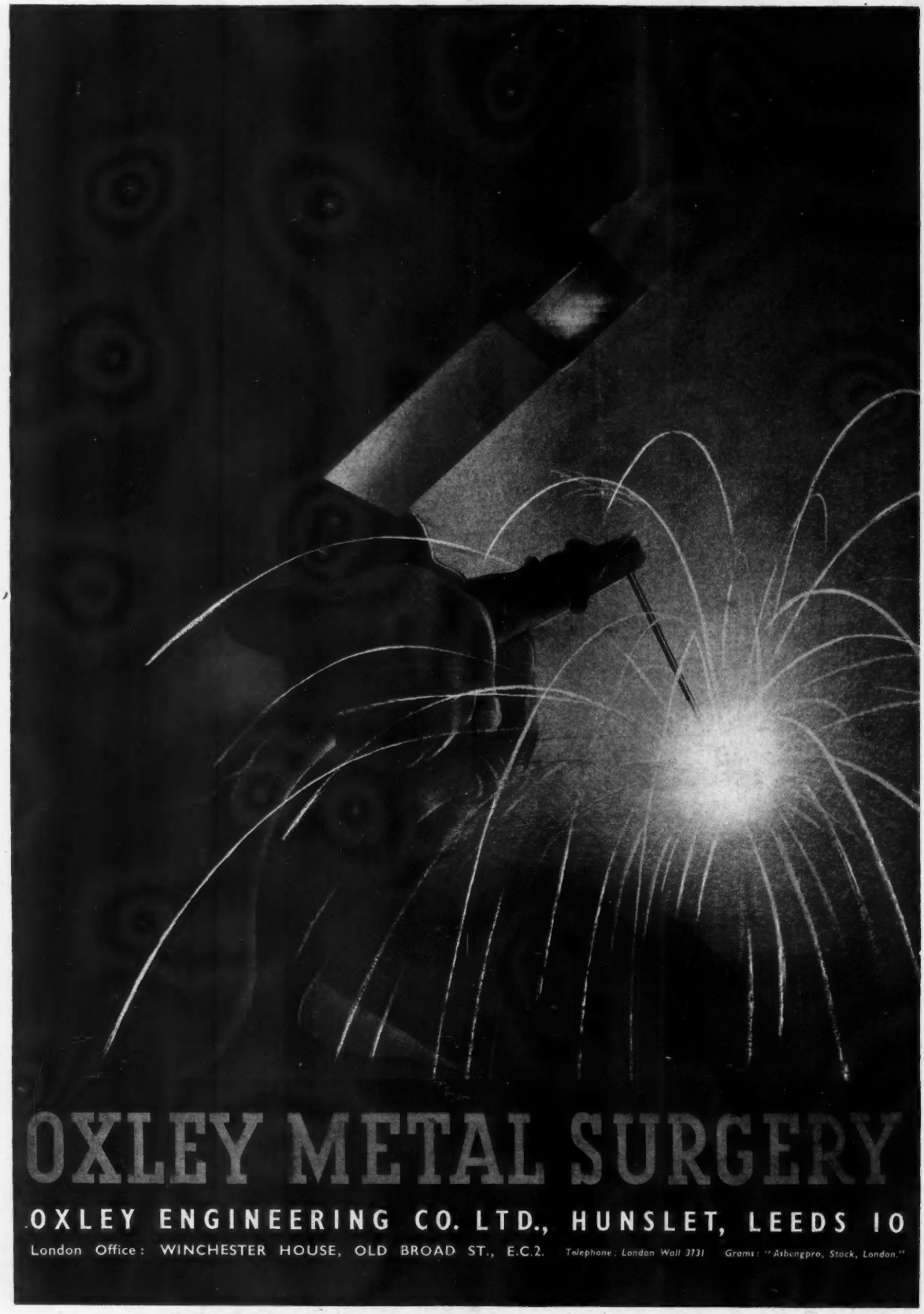
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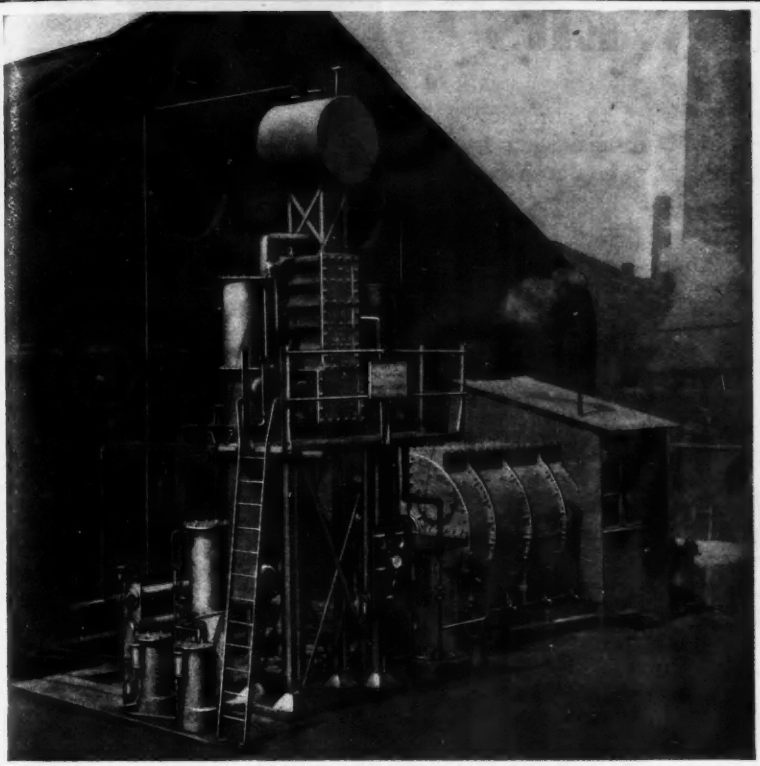

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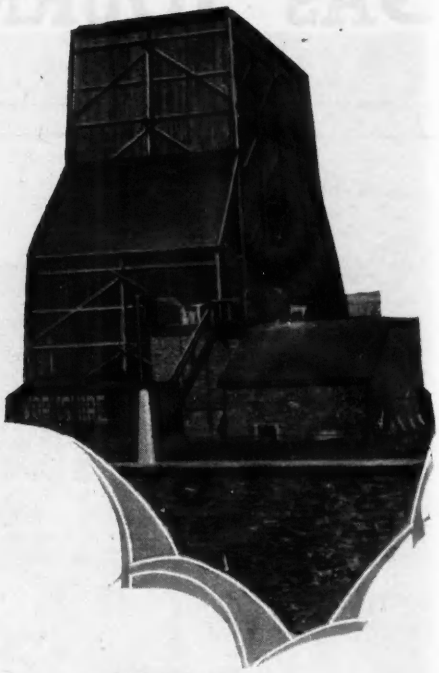

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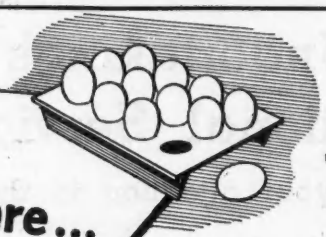

When women can again be lavish with ingredients, they'll need new gas cookers. Vulcan will meet this need.

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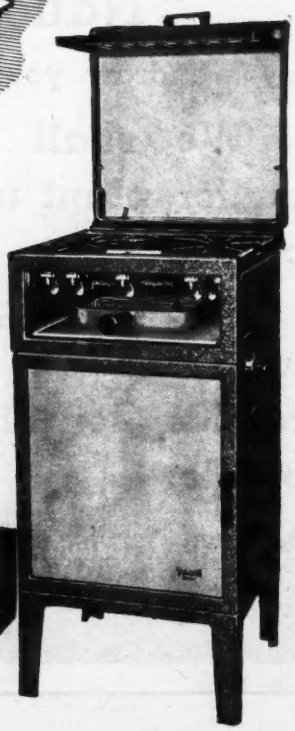
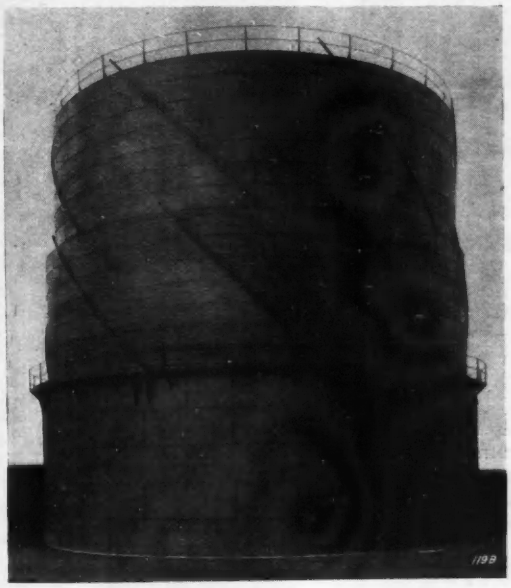


VULCAN *Stoves*

THE VULCAN STOVE CO. LTD., EXETER V.1

GASHOLDERS



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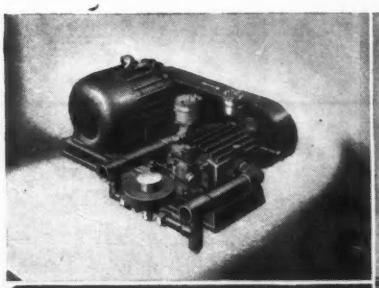

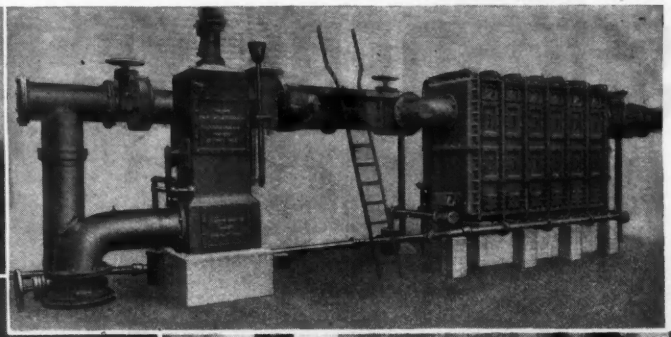

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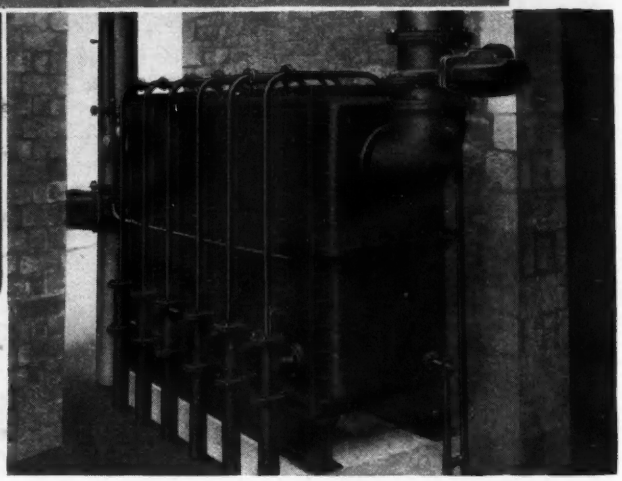
PROVISIONALLY PATENTED

New Simplified Circulating System



Top right illustration shows the "Eclipse" P. & A. Tar Extractor and "Pumpless" Static Washer in a Yorkshire Works.

The maintenance and worry of mechanically operated parts is eliminated by the Clapham innovation for liquor circulation in static ammonia, naphthalene and benzole washers.

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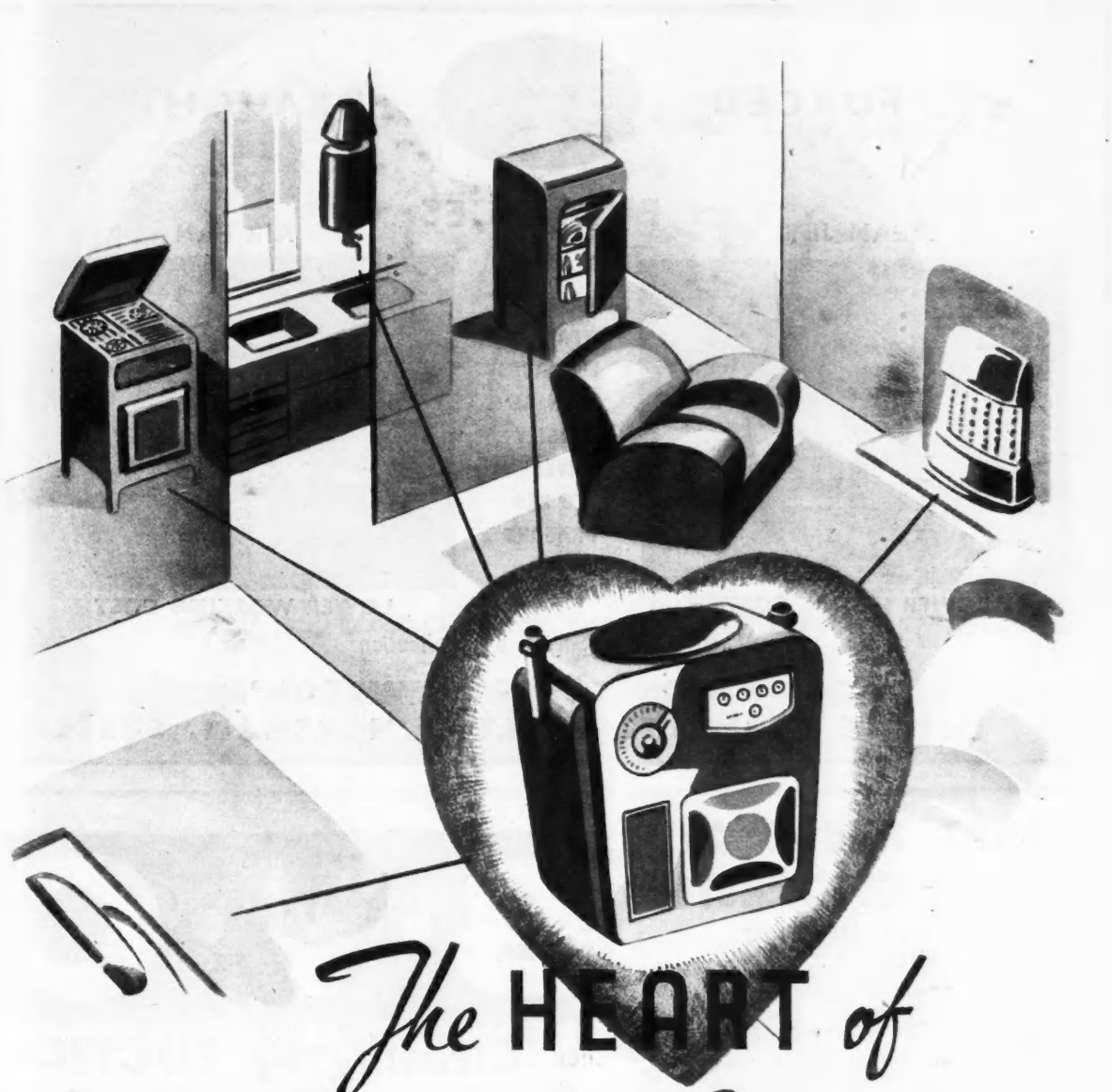

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Gas Stoves—Refrigerators—Geysers—Gas Fires—will be vastly improved after the war—and Gas Meters will be better too. In fact, the Gas Meter will be called upon to give a much more strenuous service in the modern home.

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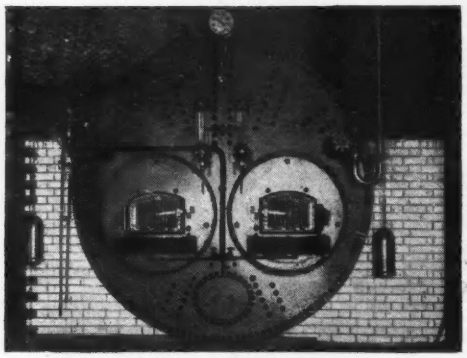
STEAM JET



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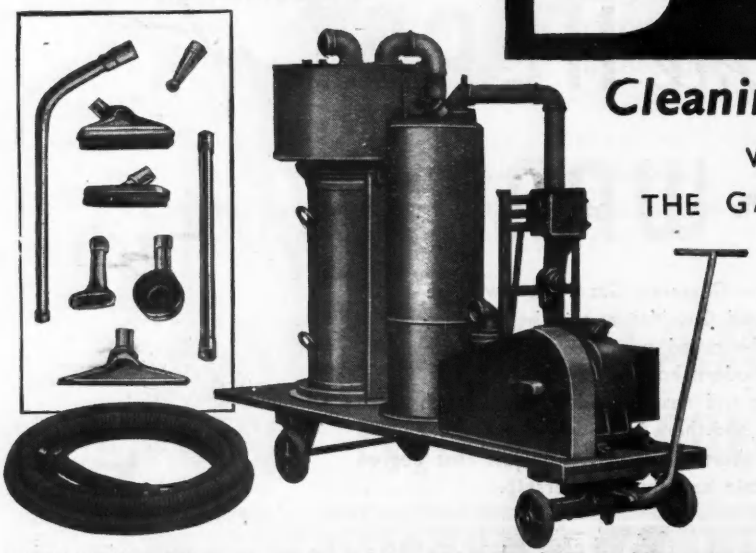

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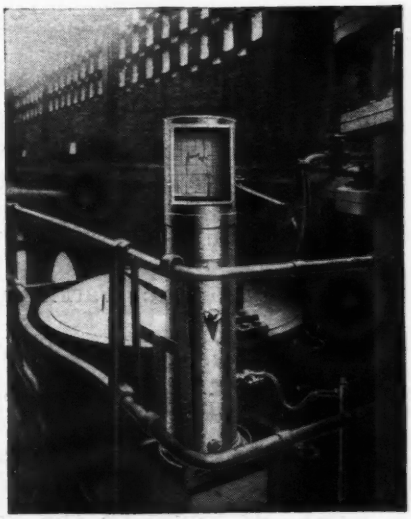

Arkon Pressure and Vacuum Recorder measuring the "pull" from Retort House Governor—Courtesy of the Gas Light & Coke Co.

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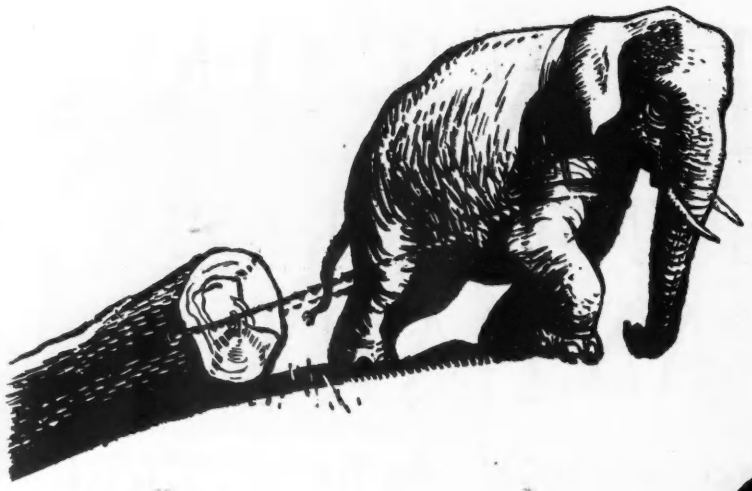

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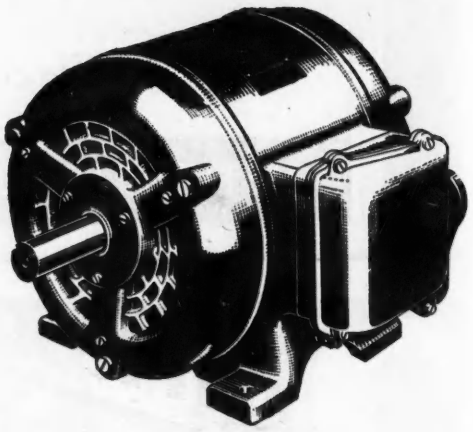

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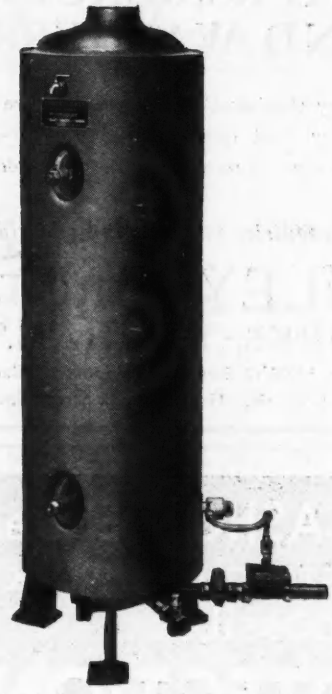

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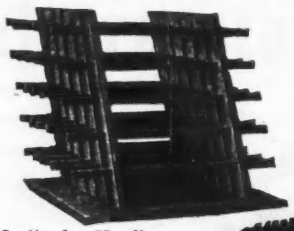

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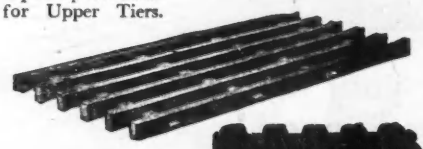

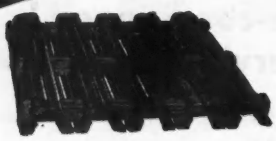

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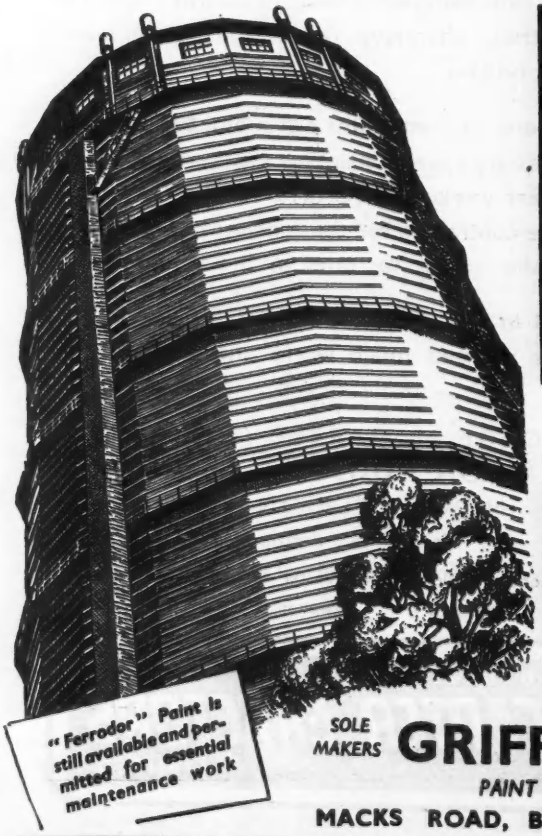

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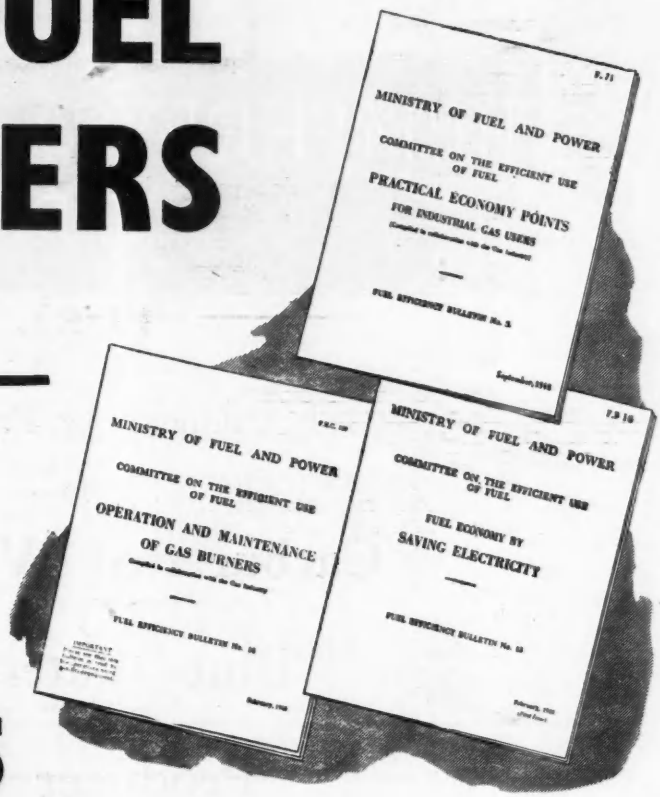
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CONTENTS

EDITORIAL NOTES

New Housing 335
Fuel for New Homes . . . 335
American Gas Industry . . . 336
The Coal Problem 336
Industry and University Education . 336

Personal 336

Obituary 336
Diary 336
Letters to the Editor 337
Location of Underground Services . 337
British Standards Institution . . 337
Architects and Heating Engineers at Dorland Hall 337
American Gas Industry in 1944 . . 338
Coal Tar Fuels 338

The Carbonizing Industries after the War. By G. E. Foxwell, D.Sc., F.Inst.P., F.Inst.F., M.Inst.Gas E. (*concluded*) 339
Complete Gasification: Thermal Considerations 342
The Gas Industry and its Operatives . 344
Housing Problems and Gas Service . 347

Gas Products Prices 349
Gas Stocks and Shares 349

THIS WEEK'S ADVERTISERS

	PAGE
A.G.E. Machinery, Ltd.	S2
Alder & Mackay, Ltd.	S2
Bale & Church, Ltd.	351
Balfour, Henry, & Co., Ltd.	323
Blakeley, Firth, Sons & Co., Ltd.	351
British Fittings Co. (Hendon), Ltd.	S8
British Vacuum Cleaner & Engineering Co., Ltd.	326
Brockhouse Heater Co., Ltd.	329
Carter-Erectors, Ltd.	329
Chemical Engineering & Wilton's Patent Furnace Co., Ltd.	326
Clapham Bros., Ltd.	324
Cowan, W. & B.	Cover III
Crompton Parkinson, Ltd.	328
Crossley, Bros.	330
Dempster, R. & J., Ltd.	321
Dempster, Robert, & Sons, Ltd.	351
Detel Products, Ltd.	S5
Evans, Joseph, & Sons (Wolverhampton), Ltd.	Cover IV
Ewart Chainbelt Co., Ltd.	S8
Fluxite, Ltd.	351
Gas Purification & Chemical Co., Ltd.	352
Glover, Thos., & Co., Ltd.	Cover I, 334
Goodall, Clayton & Co., Ltd.	Cover IV
Grant & West, Ltd.	352
Griffiths Bros. & Co. (London), Ltd.	330
Harrisons (London), Ltd.	351
Harris & Pearson, Ltd.	Cover IV
Hewittic Electric Co., Ltd.	S3
Holmes, W. C., & Co., Ltd.	S1
Horden Collieries, Ltd.	S7
Humphreys & Glasgow, Ltd.	332
Jobling, James A., & Co., Ltd.	S3
Keith Blackman, Ltd.	S8
Keith Piercy, Ltd.	350
King, Geo. W., Ltd.	S5
Laidlaw, R., & Son (Edin.), Ltd.	S4
London Electric Firm	S8
Main, R. & A., Ltd.	346
Menno Compressed Air Greasecup Co., Ltd.	351
Mewburn, Ellis & Co.	351
Ministry of Fuel and Power	331
Niagara Screens (Great Britain), Ltd.	S4
Oxley Engineering Co., Ltd.	Cover II
Parkinson Stove Co., Ltd.	345
Parkinson, W., & Co.	334
Pass, E., & Co., Ltd.	S6
Peebles & Co., Ltd.	S5
Reavell & Co., Ltd.	S8
Russell, S., & Co., Ltd.	S7
Stanton Ironworks, Ltd.	327
Sternol, Ltd.	S6
Thomas & Bishop, Ltd.	349
Technological Institute of Great Britain	351
Trotter, Haines & Corbett, Ltd.	351
Visco Engineering Co., Ltd.	322
Vulcan Stove Co., Ltd.	322
Walker, Crosweller & Co., Ltd.	327
West's Gas Improvement Co., Ltd.	348
Wilkes, A. H., & Co.	S7
Wilson, Geo., Gas Meters, Ltd.	325
Willmott, A. R., & Co.	S7
Woodall-Duckham Co.	343
Wright, Alex., & Co., Ltd.	333
Trade Cards	349
Appointments Vacant and Wanted	352
Contracts Open	352
Educational	351
Patents	351
Plant, &c.	351
Plant, &c., For Sale and Wanted	351
Repair Work	352

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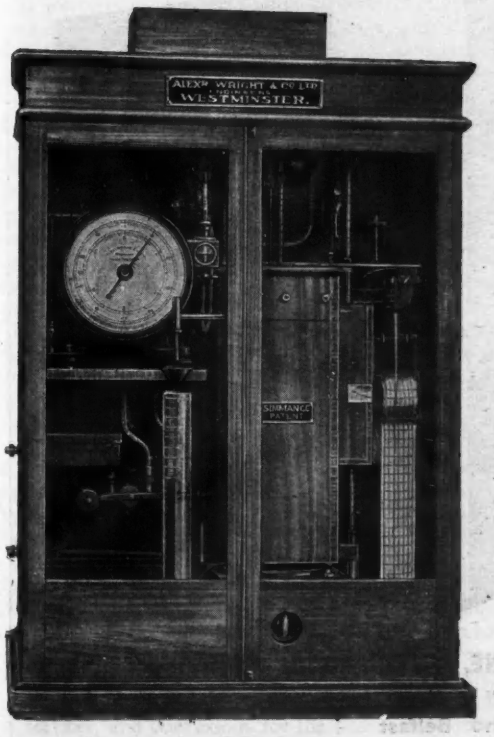

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GAS JOURNAL, MAR. 14, 1945

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EDITORIAL NOTES

NEW HOUSING

SUDDEN and swift have been the changes in Government plans about new housing. In rapid succession recently we have had statements by the Minister of Reconstruction, the Minister of Works, and the Minister of Health. A year ago the idea was to build something like half-a-million temporary bungalows of the prefabricated type and of steel construction. The number has dwindled to an unknown quantity probably below 100,000, and the types of dwelling do not include the pressed steel house so much favoured a year ago. Manufacturers of temporary houses have been asked not to enter into commitments beyond requirements for the next 12 months' production. We have been told that the building of temporary houses during this period remains a cardinal policy of the Government. At the same time it has been announced that the plan is to switch over, as soon as practicable, to the construction of permanent dwellings; the aim has been stated as 300,000 permanent houses built or building within two years of Germany's defeat, though a more optimistic figure (500,000, total of temporary and permanent houses) has been put forward.

Not for the first time, promise has exceeded practicability, and even the composite figure of 400,000 houses in two years from the end of war is purely anticipatory. If, however, Government conceptions are less in the clouds, the demand for housing has not just remained where it was. It has increased, and this demand must obviously ultimately be satisfied. Irrespective of the nature of the programme—the numerical relationship between temporary and permanent housing—the direct concern of the Gas Industry in providing economically and in the best interests of coal conservation domestic fuel services also, as a corollary, remains unchanged. In regard to temporary housing, the Government's immediate plan, the Gas Industry has undoubtedly been helped greatly by the Domestic Heat Services Committee, sponsored by the Industry and both working and speaking for it. Some information about the Committee's work has been given lately; even so, we are not sure that all gas undertakings quite appreciate what has in fact been done, and how, individually, each undertaking could help. We have had an account of some of the work from the Committee's Chairman, Mr. Tom Brown; we concluded publication of the account in the "JOURNAL" last week. On the whole question of fuel services to new houses, temporary and otherwise, this practical, working Committee is, we know, out to help, and can offer help to, individual undertakings; as in so many other directions, ultimate success rests on the extent to which these undertakings actively and wholeheartedly co-operate. And we would add that, with the kaleidoscopic nature of Government departments' ideas and requirements, the exercise of patience, tolerance, and understanding, too, is needed.

The story of the Committee's activities in regard to temporary dwellings has been told in part by Mr. Brown. True, temporary dwellings do not figure so largely as they did a few weeks ago, but the Committee's work has not been reduced because of that. It is translatable to permanent housing, whether or not the houses are prefabricated. And even 100,000 houses represent the accommodation for a considerable number of people, and what equipment goes into these dwellings is certain to have its influence on the future. Because of this we emphasize the need for uniformity of policy on the matter within the Gas Industry itself. For example, the work to be undertaken in providing mains, services, and connexions for the houses is bound to be much the same in every area, and gas undertakings should establish a common and agreed practice in quoting for it. This point is reinforced when one remembers that in certain instances more than one gas undertaking carries out work for and supplies gas to a single local authority. Already the British Gas Council has adopted the Committee's recommendations regarding payment covering mains and services and installation work, and the Committee has put forward detailed suggestions to act as a guide to individual undertakings.

Certainly, in regard to new housing, there is no reason for individual gas undertakings to query what the Gas Industry, *qua* Industry, is "doing about it." We have been greatly impressed, in fact, with the practical guidance which Headquarters—*i.e.*, the Domestic Heat Services Committee—offers. The matter of cost of fuel service which the tenant will have to bear is one item—obviously of importance. The Ministry of Health itself has stressed that local authorities, when choosing whether gas or electricity should be installed for cooking, home laundry, &c., in temporary dwellings, should have careful regard to the relative cost of these services to the tenant. Of course, figures put to local authorities by gas and electricity undertakings for "gas" or "electric" houses should, though maybe they do not always, relate strictly to the same service to the user. On matters such as this the Committee has valuable help to give. We mention this particular item merely to add point to our contention that individual undertakings have for the asking the very information calculated to help them—provided they will help themselves in their own areas, the while approaching the problem as a whole in a spirit of ready co-operation.

FUEL FOR NEW HOMES

WE have recently and in all good faith commented on the first reactions of many local authorities regarding fuel services for new homes, and in particular temporary dwellings, and as we have mentioned, we have had a good deal of correspondence on the subject citing instances where local councils have, without consulting their local gas undertakings and examining fully the relative costs of gas and electricity, decided that temporary housing coming within their jurisdiction shall be supplied with electricity to the exclusion of gas. Such arbitrary decisions, in the absence of examination of costs and other relevant aspects, are contrary to the intention of the Ministry of Health. Surprisingly, the Gas Engineer of Milford Haven, in a letter which we publish on a later page of our issue to-day, suggests that any alleged injustice may merely be propaganda and that, to him, the story does not ring true. He puts forward a table based on what has actually taken place in the areas of 33 local authorities, pointing out that in their decisions 14 local authorities chose gas while 9 chose electricity for cooking and other services. The remaining decisions, as will be seen, cancel out and do not enter into the argument. What we would emphasize is this. Pre-war, the installation of gas and electricity for cooking was in the ratio of eight or nine to one. What has happened in the war period to invalidate this ratio, and is the change brought out in the table calculated to be in the best interests of the tenant who will have to foot the bill and of the nation in regard to the wisest use of coal? Certainly the matter has nothing whatever to do with "companies defending their capital against the growing demand for central or local government"—the suggestion advanced by our correspondent—and we refuse to be sidetracked by any such issue. The question is a straightforward one for the Gas Industry—irrespective of whether the constituent gas undertakings are company or municipally owned—to face as a whole.

AMERICAN GAS INDUSTRY

At the end of 1944, 19,775,000 consumers (manufactured gas, 10,634,000; natural gas, 9,141,000) were being served by the American Gas Industry. Industrial sales of manufactured gas had increased by 5.2% and of natural gas 4.7% over the year. Domestic sales grew by 4.5% and 10.6% respectively. Research plans went ahead; actually appropriations for research were nearly three times higher than the annual average for the nine-year period from 1934–42. Much of the research was concerned with war production problems; at the same time there was inaugurated the most extensive fundamental research programme in the Industry's history, largely dealing with the use of gas in the home. The Institute of Gas Technology, to the work of which we have referred before in these columns, became busier than ever. Two major projects in the field of gasification gained support—one involving the use of highly superheated steam and "fluidized" pulverized coal; the other a continuous gasification system using "atomized" coal. A great deal was done generally by the Industry in strengthening national advertising and preparing for sales promotion. For example, there was the inauguration of an Industry-wide kitchen planning programme—a co-operative plan which has won the interest of related industries such as steel, glass, and plastics. The activities of the Home Service Division were extended.

We have taken the foregoing facts and figures from an account just to hand by the President of the American Gas Association of the activities during the past year—a story of which the Industry over there can justifiably be proud. The record covers both manufactured gas and natural gas in the industrial and the domestic fields and augurs well for the future, for the wartime achievements are to be measured not merely in terms of greater war output, but must be analyzed in terms of eventual peacetime use. Many radical changes in industrial production are directly traceable to the use of gas; the foundation has been laid for permanent industrial gas loads of wide scope and variety.

The Coal Problem

We have had the proposals of the colliery owners—*i.e.*, the Foot "Plan for Coal"—and those of the miners' representatives, the latter going all out for nationalization, for the amelioration of the coal-mining industry. Last week Sir Richard Redmayne summed up the situation while offering his own suggestions. State ownership he rules out on the grounds that it would not secure increased output of coal, an economic price of coal, and peace within the industry. Nor does he think the scheme accepted by the colliery owners would fulfil requirements, arguing that it leaves out of consideration representation on the proposed central coal board of the interests of the miners and those of coal consumers. His own suggestions are: (1) There should be carried into effect the financial combination of collieries by coalfields. (2) Joint district committees composed of equal representation of owners and miners should be set up to deal with local affairs. (3) A national council should be established comprising an equal number of representatives of colliery owners and miners, drawn from the district committees, and, in addition thereto, representatives of the coal consumers (*e.g.*, railways, electricity and gas undertakings, power users, and domestic users) with an independent chairman, appointed by the Minister of Fuel and Power or the Ministry of Labour, or by the two Ministries in consultation. Proposals such as those outlined, he believes, would not interfere with the flexibility of daily management so necessary in this highly technical industry; and he adds: "It may be asked—why should interests outside the immediate purview of the mining industry itself be represented on the national coal council? My answer would be that, coal being a chief national basic raw material, it enters into and has a bearing on nearly every other branch of industry . . ."

Industry and University Education

Which man does industry want, the professional scientist or the trained technologist? This was a question posed recently in an Address by Mr. E. R. Davis, Director of Research, Kodak Ltd. He was speaking of the photographic industry, where the demand is not for photographic technologists, but his comments have much general significance. In his own experience, and it extends over many years, the problems of the industrial research worker always tend to lead him back to problems in pure or applied science. "We consider," he said, "that we are best able to teach our staff that part of our technology which they need for their work. We want, therefore, from the Universities men trained as scientists and research workers, and it is for this reason that, in interviewing a man for a post in the laboratory, we may pay but little attention to the subject of his Ph.D. thesis. What we are always trying to discover is whether he is one of those rare people with a real flair for research. Such a man might be of as much value to almost any other industry as to ours; there is no cause therefore for him to be trained specifically for ours." The main aim of post-graduate work, he added, should be to train a man in research methods. Any attempt on the part of industry, whether by persuasion or by endowment, to cause Universities to set up technological departments with the sole object of training men for a particular industry should be viewed with some suspicion. He emphasized that in saying this he was not under-rating the importance of technologists. Such men are required in large numbers—larger than the capacities of the Universities will permit them to meet—but this task should, in his view, be left in the main to the technical colleges.

Personal

After 28 years' service, Mr. CHARLES A. MURRAY, Managing Director of British Tar Products Ltd., is retiring from active business after March 31 next.

* * *

Mr. H. W. CREMER, M.Sc., F.R.I.C., M.I.Chem.E., has resigned from his position of Director of Chemical Engineering Studies in the University of London, King's College, and is now Senior Chemical Engineer with Sir Alexander Gibb and Partners, with whom he has been working throughout the war on the design and construction of various Government works connected with the war effort. Mr. Cremer is a past Chairman of the Chemical Engineering Group of the Society of Chemical Industry and present Honorary Treasurer of the Institution of Chemical Engineers.

* * *

Dorchester Gas and Coke Company have lost the services of one of their oldest employees through the retirement, after 39 years, of Mr. JOHN SYMES, the Works Foreman. As a parting gift he has received a wallet, cheque, and cash from the Board of Directors, the office staff, and his fellow workmen, accompanied by a letter of good wishes signed by all the subscribers. Major H. O. Lock, Chairman, made the presentation. To Mr. Symes, who is in his 70th year, he extended the Company's appreciation of long and faithful service, during which he had served under three managers and had seen the output of gas for Dorchester increased fivefold. Mr. F. Allen (a Director), Mr. H. A. Cole (Engineer and Manager), and Mr. George Hine, one of the oldest employees, also paid warm tributes to Mr. Symes and expressed regret at his retirement.

Obituary

Mr. FRANK DURKIN, who was Engineer to the Southampton Gaslight and Coke Company from 1911 to 1929, when he retired after 47 years' total service, died on Wednesday last. Mr. Durkin was a son of the late Samuel Westall Durkin, who was President of the Gas Institute in 1902.

* * *

The death has occurred of Mr. GEORGE KEITH, Chairman and Managing Director of Keith Blackman, Ltd. He was 69 years of age. Deceased had had a life-long connexion with the Company, his father, James Keith, having been one of its founders. Mr. George Keith devoted himself unsparingly to the interests of the Company and made a valuable contribution to its success, particularly on the technical side. He joined the firm in 1893, celebrated his Jubilee in 1943, and was elected Chairman and Managing Director in 1929.

Diary

Mar. 16.—I.G.E.: Liquor Effluents and Ammonia Committee, Gas Industry House, 12.15 p.m.

Mar. 19.—London and Counties Coke Association: Finance Committee, 11 a.m.; Executive Committee, 11.30 a.m.; Central Committee, 1.30 p.m., Gas Industry House.

Mar. 20.—S.C.I. Chemical Engineering Group: Joint meeting with Institution of Chemical Engineers, Burlington House, W. 1, 2.30 p.m. Discussion on "Industrial Research" to be opened by Dr. E. W. Smith, C.B.E.

Mar. 21.—Southern Association of Gas Engineers and Managers (Eastern District): Gas Industry House, 2.30 p.m. Paper by J. E. Davis (South Metropolitan).

Mar. 22.—Midland Counties Coke Association: Annual Meeting, King Edward House, Birmingham, 2.30 p.m.

Mar. 24.—Yorkshire Junior Gas Association: Short Paper Meeting, Leeds University, 2.30 p.m.

Letters to the Editor

National Smoke Abatement Society

DEAR SIR,—I was pleased to read the letter from Mr. C. S. Shapley about the subscriptions made by gas undertakings to the National Smoke Abatement Society. The Society is at present making an appeal for increased subscriptions and new members to enable it to build up an income adequate for the many tasks it is anxious to do when—and before—reconstruction and housing begins.

This appeal has had a moderately encouraging start, but we still have a very long way to go. In addition to a substantial increase in subscriptions from present members, for which Mr. Shapley asks, I would like to invite the many non-subscribing gas undertakings to become members of the Society. Even a single guinea from all of these would make a substantial difference to the Society's effectiveness.

Chandos House, Yours faithfully,
Buckingham Gate, ARNOLD MARSH,
Westminster, S.W. 1. General Secretary,
March 8, 1945. National Smoke Abatement Society.

Gas *v.* Electricity in Temporary Dwellings

DEAR SIR,—It would appear from the Gas Press that local authorities are doing great injustice to the Gas Industry, and I gather that we are all expected to rise up as one body about it. To me the story does not ring true, and even after five years without municipal elections I know of no evidence which would support the view that councils in general are completely disregarding the desires of the electorate. I have now received some data in respect of 33 local authorities. This is what they reveal on analysis:

Councils owning.	Choice. All-gas.	All-electricity.	Gas: Some electricity.	Electricity: Some gas.	50-50 gas and electricity.
Gas only (1)	1	—	—	—	—
Electricity only (17)	3	8	1	3*	2
Gas and electricity (9)	6	1	1	—	1
Neither gas nor electricity (6)	4	—	1	—	1
Total Councils (33)	14	9	3	3	4

**Note.*—Only slightly in favour of electricity.

I suggest that the British Gas Council gather and issue all available facts, and meantime I trust that local authority engineers will realize that the alleged injustice may merely be propaganda. "Speaking with one voice" is a fine idea so long as it is not in fact the voice of the companies defending their capital against the growing public demand for central or local government ownership of the utilities. To gas engineers I would suggest that once gas undertakings are under local authority ownership equal payment and conditions with the electricity departments will follow swiftly. Good salaries and conditions will draw good men, and the Industry will commence to receive that "blood transfusion" so urgently required.

Milford Haven U.D.C., Yours faithfully,
Town Hall, Milford Haven. JOHN H. DANIELS,
March 5, 1945. Gas Engineer and Manager.

Location of Underground Services

The Institution of Civil Engineers, with the Institution of Municipal and County Engineers, have appointed a Joint Committee to draw up notes for the use of engineers on the best location of underground services. The Committee will consist of Mr. W. H. Morgan, M.Inst. C.E., M.I.Mun. and Cy.E., County Engineer, Middlesex, as Chairman, and 10 members who will include City and Borough Engineers and other engineers who have specialized in water supply, sewage disposal and main drainage, electricity and gas supplies, and Post Office services. Members representing electricity and gas supplies and Post Office services have been nominated by or in consultation with the Institution of Electrical Engineers, the Institution of Gas Engineers, and the Chief Engineer, G.P.O., respectively. The Institution of Gas Engineers is represented on the Joint Committee by the Chairman of its Pipes Committee, Mr. H. J. Escreet, B.Sc.(Eng.), M.Inst.C.E. (Distribution Superintendent, Gas Light and Coke Company).

The Joint Committee will welcome any notes or suggestions, and gas engineers should address these either to the Secretary of the Institution of Gas Engineers, 1, Grosvenor Place, S.W. 1, or to the Secretary, Joint Committee, c/o Secretary, the Institution of Civil Engineers, Great George Street, Westminster, S.W. 1.

Hawick Town Council, after its recent controversy on gas *versus* electricity, heard a further discussion as to the equipment to be installed in 100 workmen's houses to be built by the Scottish Special Housing Association post war. Following a long discussion on the lines of the earlier debates on temporary housing, it was agreed that of these 100 houses, 50 houses should be fitted with electric cookers and wash-boilers and 50 with gas cookers and wash-boilers.

British Standards Institution

Sir John Greenly, in proposing the toast of the B.S.I. at a luncheon on March 6, referred to proposals which had been made in 1895 by Mr. H. W. Skelton, a London iron and steel merchant, which had led to the formation of what was now known throughout the world as the B.S.I. The Institution had over 1,500 technical committees preparing British Standards for nearly all branches of industry, and he emphasized the value British Standards had been to the engineering home and export trade during the years before the war. The B.S.I., Sir John said, had created a meaning to the words "British Standard," and had given that meaning a very high reputation.

Lord Woolton, President of the British Standards Institution, referring to the establishment of the British Standards Institution in 1901 by the engineering industry, said that no one could question that in recognizing the value of standardization the British engineering industry had been able to lead the world in the production of munitions. Standardization was one of the basic principles of efficient production; it ensured the maximum value per unit of price; it gave the consumer protection by guaranteeing a standard of quality or performance. He felt it was necessary to see that the public were aware that goods made to a British Standard meant value for money. In war they had seen the advantages of standards; let them apply the lesson they had learnt from war to the needs of peace.

In the absence of Sir William Larke, Chairman of the General Council, through illness, Sir Percy Ashley, Vice-President of the Institution, proposed a vote of thanks to Lord Woolton.

Architects and Heating Engineers at Dorland Hall

As briefly recorded in the "JOURNAL" last week, at the invitation of the Gas Light and Coke Company leading architects, master builders, and heating and ventilating engineers inspected the Kitchen Planning Exhibition at Dorland Hall on March 1, and were afterwards entertained at luncheon.

After welcoming the guests Mr. A. E. Sylvester, the Managing Director of the Company, said: "On the national side it is difficult at all times to be very definite or precise as to the policy the Gas Industry will pursue in the future. There are many differing views up and down the country which means that national policy must be a compromise. But on our own policy we in the Company are very definite. In the first place we consider that it is our business to provide the best possible service to the public, and to do this we must take a broad national rather than a sectional view of our responsibilities. By pressing the claims of gas only in those directions where it is better than some other fuel, we show our confidence in gas. We believe that in adopting this policy we shall not only give the best service to the public, but in the end the Company itself will benefit."

It is, Mr. Sylvester continued, the Company's desire to conduct its business in the closest possible collaboration with architects, builders, and heating engineers. On the question of price, owing to the war it had been necessary to increase the price of gas. Increases had, however, been kept to the barest minimum, and it was hoped within the next few years to bring the price down again. Secondly he would like to comment on the comparative cost of gas and electricity in relation to price, a matter on which he had touched in a recent letter to the *Daily Telegraph.* He felt very strongly that the comparative prices generally quoted for gas and electricity in the home were not on a fair basis. It was clear that electricity was being offered for domestic uses at prices unobtainable for industrial processes; this obviously called for examination. At the present moment an Advisory Council set up by the Minister of Fuel and Power was examining this problem. The Company was content to leave the matter to the Council's independent judgment, and its report was awaited with great interest.

In proposing the vote of thanks Mr. C. Grey Wornum, F.R.I.B.A., said he hoped everyone present had been as much impressed as he had by Mr. Sylvester's testimony of faith in the Gas Industry, and Dr. Oscar Faber, the President of the Institution of Heating and Ventilating Engineers, seconding, said it was evident the Gas Industry had made tremendous strides, that it was preparing to render a second to none service to the public, and to keep the standard of gas equipment at a very high level.

In the Course of a Chadwick Lecture given on March 13, Dr. A. Parker, Director of Fuel Research, said that no domestic appliance had yet been devised to use bituminous coal without producing smoke, and in general it was not yet practicable to prevent pollution by sulphurous gases from the combustion of coal and coke. No one development alone would greatly reduce pollution. There must be several lines of attack. These included efficient cleaning of coal, more efficient use of coal with improved appliances, and the replacement, as far as was economically practicable, of raw coal by coke, gas, and electricity. Changes of this kind could only be made gradually if the demands for the various fuels and forms of energy were not to overstep the supply; and there must be a suitable balance if the resources of the different types of coal were to be used in the best way in the broad national interest.

American Gas Industry in 1944

In the course of a statement on the activities of the American Gas Industry in 1944, the President of the American Gas Association, Mr. J. French Robinson, stated that operating at high efficiency within the limits of governmental restrictions, the Industry established new records in the number of customers served and the volume of gas delivered to wartime plants and to homes and commercial establishments. Year-end statistics reveal that the Industry is serving19,775,000 customers—the largest number ever connected to its mains.

The outstanding development of the year, continued Mr. Robinson, was enthusiastic support by the Gas Industry of a plan adopted by the Executive Board of the American Gas Association calling for an expenditure of $1,400,000 annually for three years for increased research, national advertising, and general sales promotion. At year-end, subscriptions to this fund were mounting rapidly.

The most extensive fundamental research programmes in the Industry's history have been carried on at the Association's testing laboratories in Cleveland and Los Angeles, and the Institute of Gas Technology, Chicago. A solid foundation in domestic gas research was also erected for the future development of gas appliances to meet the demands of modern consumer markets.

Perhaps the chief development of the year in the natural gas industry was the completion of the gas line from Texas to West Virginia. This line is now delivering more than 200,000,000 cu.ft. of gas per day into the highly industrialized area in the Appalachian region. A new gas transmission line in excess of 24 in. in diameter and 1,000 miles long from Texas to California is contemplated for construction in 1945.

In a move to simplify the acquisition of strictly modern gas kitchens by millions of home-makers, sales departments of gas companies have given strong backing to the inauguration of an industry-wide kitchen planning programme. This movement will co-ordinate the efforts of manufacturers of kitchen cabinets with those of manufacturers of gas appliances, and has already won the interest of related industries such as steel, glass, and plastics. The Gas Industry's national advertising programme, now in its ninth consecutive year, has been enlarged. Funds for national advertising are now in excess of $400,000.

Gas for industrial heating purposes continues to be used at peak levels with some shifting as demands for various munitions and war products change from time to time. Airplane production in certain classes has been reduced, whereas demand for heavy ammunition and guns has increased to such an extent that peaks of industrial gas demands have reached new heights.

The home service branch of the Industry continued its active promotion of the wartime programme of nutrition and food conservation. Some 12,000,000 customer contacts were made by home service personnel to advance the Government's programmes of food, fuel and appliance conservation. It is estimated that millions of quarts of food have been preserved under the direct supervision of the Gas Industry's home service departments, thus aiding substantially the cause of national wartime food conservation.

The following estimates cover the Industry for 1944.

Manufactured Gas.

(Includes Mixed Gas Companies.)

Customers.	1944.	1843.	Per cent. change.
Domestic	9,797,000	9,635,000	+1.7
House heating	399,000	393,000	+1.4
Industrial and commercial	429,000	425,000	+0.9
Miscellaneous	9,000	9,000	...
Total	10,634,000	10,462,000	+1.6
Gas Sales (1,000 *cu.ft.*).			
Domestic	221,648,000	209,458,000	+5.8
House heating	85,117,000	84,112,000	+1.2
Industrial and commercial	176,423,000	167,636,000	+5.2
Miscellaneous	4,057,000	3,852,000	+5.3
Total	487,245,000	465,058,000	+4.8

Natural Gas.

Customers.	1944.	1943.	Per cent. change.
Domestic (incl. house heating)	8,463,000	8,282,000	+2.2
Industrial and commercial	676,000	649,000	+4.1
Miscellaneous	2,000	2,000	...
Total	9,141,000	8,933,000	+2.3
Gas Sales (1,000 *cu.ft.*).			
Domestic (incl. house heating)	567,417,000	512,854,000	+10.6
Industrial and commercial	1,182,544,000	1,129,880,000	+ 4.7
Electric generation	388,604,000	299,553,000	+29.7
Total commercial, industrial, and electric generation	1,571,148,000	1,429,433,000	+ 9.9
Miscellaneous	50,641,000	44,634,000	+13.5
Total	2,189,206,000	1,986,921,000	+10.2

The fact that goods made of raw materials in short supply owing to war conditions are advertised in the "Journal" should not be taken as an indication that they are necessarily available for export.

Coal Tar Fuels*

Reviewed by H. M. Spiers.

Tar fuels have, to a substantial extent, replaced imported petroleum fuels during the war period and have rendered good service in numerous industries. The appearance of a book dealing comprehensively with the utilization of these fuels is therefore very welcome, all the more so since the volume has been compiled by the Tar Fuels Technical Sub-Committee of the Association of Tar Distillers under the able editorship of J. S. Sach.

Tar fuels have been developed in a really scientific manner, no less than seven grades being available to cover the needs of all fields of application. They range from a fluid creosote to a hard pitch capable of being used in pulverized form. A rational nomenclature has been adopted for the characterization of the fuels, which are graded in terms of the temperature in degrees Fahrenheit at which the particular fuel is in a condition suitable for atomization.

In view of the diversity of the fuels concerned, a number of problems are involved in their distribution, storage, handling, and combustion. With one exception (pulverized pitch) all must be pumped at one or more stages in their use; hence questions of viscosity and pressure drop are of great importance. Some grades must be melted and preheated by use of steam, hot oil circulation, or electricity, and these operations involve questions of heat transmission. Problems of heat insulation arise in connexion with the transport of the fuels in the hot condition. Special filters are necessary for the removal of foreign matter and various methods of atomization are available. Other questions which arise are concerned with the actual combustion of the fuel—namely, air requirements, flame and furnace temperatures, flame shape and condition, and burner design and capacity.

All these aspects are dealt with in a very practical manner with the help of more than one hundred diagrams and charts. The book is, indeed, a complete treatise on all that pertains to tar fuels. The fact that it is comparatively small does not imply that the development of tar fuels has been a simple matter. In fact, numerous difficulties have arisen, particularly as regards the use of the heavier grades, but all have been successfully solved. The volume presents in summarized form what experience has shown to be the best practice. So far as the wartime use of tar fuels is concerned, the book's publication is rather belated. However, the information now assembled has all along been available to those who have needed it, and the absence of the book has not prevented the widespread use of the fuels in question. It is, moreover, likely that tar fuels will continue to be used after the war. The book is, therefore, of more than mere passing interest. It is, however, to be hoped that, in peacetime, tar products will only be used as fuel when no more attractive outlets for their utilization are available.

* *Coal Tar Fuels. Their Derivation, Properties, and Application.* Edited by J. S. Sach. [London: Association of Tar Distillers, 1944. Pp. viii + 140. Price 15s. net.]

Radiation, Ltd.—The Directors have decided to recommend a dividend on the Ordinary stock for the year 1944 of 10%, less tax, the same as for 1943. Net income for the year was £148,522, compared with £151,110 for the previous year. Transfer books will be closed from Mar. 14 to 29, and dividend warrants will be despatched on April 14.

It is Proposed that the capital of the Northampton Gaslight Company should be raised a further £150,000 to increase the efficiency and capacity of the Undertaking.

The Following recently issued British Standard Specification may be obtained on application to the Secretary, The Institution of Gas Engineers, 1, Grosvenor Place, London, S.W. 1: B.S.659: 1944, light gauge copper tubes for water, gas, and sanitation. [Price 2s. net, post free.

The Gas Industry's Kitchen Planning Exhibition will be on view in April at Bentalls, Kingston-on-Thames, and it is hoped that either in whole or in part it may be seen in many parts of England and Scotland during the course of the year.

It Has Been Resolved by the Finance and Parliamentary Committee of the Leeds Corporation that the basic salary scale attached to the post of Assistant Engineer and General Manager of the Gas Department be £1,000 per annum (minimum) with effect from April 1, 1945, with annual increments of £50 to £1,200 per annum (maximum).

Such is the Present coal supply position following the strike of colliery firemen that industrial and business firms in Scotland have been ordered to cut their gas and electricity consumption by 25%. A compulsory direction has been issued by the Regional Fuel and Power Controller, Lord Balfour, in conjunction with the Ministry of Production. The present coal output loss is estimated to date at about 100,000 tons. Lord Balfour stated recently that there were two classes in that direction. The Ministry of Production would issue the direction to firms under its control as to the amount of gas and electricity they would be allowed to consume. Wholesale and retail businesses would also be notified of the cuts they would have to undertake. In enforcing the direction a weekly check would be kept of meter readings in all factories.

The Carbonizing Industries After the War*

By G. E. FOXWELL, D.Sc., F.Inst.P., F.Inst.F., M.Inst.Gas E.

(*Concluded from p. 275*)

(e) *The System of Control.*

The Gas Industry is in practice controlled by its technical men, the coke oven industry by its commercial men. In this lies one of the greatest of all obstacles to closer co-operation. Technical men recognize that co-operation is better than competition, and that by working together honestly and irrespectively of hard-and-fast legal agreements, far better results will be obtained than by playing a lone hand. The difficulties needlesly set up by this diversity of control are greater than are often realized. The solution would appear to be to give the technical men in the coke oven industry greater powers, and to relegate the commercial side of the industry to its proper sphere.

(f) *The Price of Coke Oven Gas.*

The principle of coal conservation makes it imperative that no coke oven gas should be blown to waste or used for purposes such as boiler firing, for which low-grade fuel is equally suitable. Thus means must be found by which the Gas Industry can absorb all available coke oven gas. Whether it is better for coke ovens to be situated at the collieries, or to be placed near the point where the greater part of the gas and coke are used, must in the outcome depend on the economics of each case. It would seem to be in the national interest that the situation of carbonization works should be settled on this basis, just as the location of electricity generating stations is decided by the Central Electricity Board.

If the two major charges against coke oven gas—those caused by stand-by plant and peak loads—could be removed, its price could be considerably higher than it is now.

(g) *Limitations of Carbonizing Capacity.*

The capacity of gas-making plant is controlled by the Ministry of Fuel and Power. Before capital may be raised for new plant, the Ministry (formerly the Board of Trade) holds an enquiry to determine whether the extension is justified.

Under the normal and unfettered workings of private enterprise there is no authority to stop anyone from building a works and competing in any industry which is not a public utility. Up to a point this is all to the good, but when capacity is too greatly extended the result is high costs, due to high overheads arising from works operating far below capacity, accompanied by unemployment. Voluntary measures are taken by some Trade Associations to limit excess capacity.

If collaboration between coke ovens and gas undertakings resulted in stability of operation with a fair margin of profit, many collieries that do not now own coke ovens would clearly regard investment in a coking plant as profitable. The eagerness of financial firms to acquire holdings in the Gas Industry during 1930–1939 is one evidence of the value attached to stability in a competitive world. The gas undertakings would be limited in capacity; the coke ovens would not. Obviously, a situation might arise which would not be to the advantage of either. There must be some method of limiting the construction of new ovens to that necessary to meet the demand for gas and coke; there must be some arrangements for ensuring equally that there is sufficient capacity to meet demands; and there must be some control over the rate of production, over repairs and maintenance and the general working of all carbonizing plant.

Possible Methods of Co-ordination

We have thus arrived at the conclusion that gas undertakings and most colliery-owned coke ovens are likely to work in the future with the common objective of supplying gas and coke to the same markets, and that in the interests of coal conservation they should do so. It is very necessary that means should be found for removing artificial barriers, including costs, and for so regulating the industries that they will be given commercial stability, and be placed in a position to fulfil their obligations to the public.

While some individuals might prefer that things should be left as they are, this seems impossible. It is not planning; it is the subterfuge of the ostrich. There will clearly be more control of industry by the State, and that control is likely to be exercised first in such directions as export trade and the utilization of our own national resources—coal, water-power and minerals. Our problem is to fit the carbonizing industries into this new framework so that they can retain their industrial efficiency, a pre-requisite of which is the maintenance of private enterprise.

What method is to be used is a fit subject for debate, since there will be many ideas upon the subject. Three possible methods are as follows:

(1) Joint financial control, as in the West Yorkshire Gas Distribution Company. There could be interchange of share capital between the gas and coking industries. Coke oven labour should then come under the Trades Union of the Gas Industry, not that of the collieries.

(2) A comprehensive system of planning with maintenance of private enterprise could be secured by setting up a Central Carbonization Board, analogous to the Central Electricity Board.

(3) Coke ovens might be brought by the Ministry of Fuel and Power under the Gas Section of the Ministry and controlled in the same way as the Gas Industry is now controlled. Colliery-owned coke ovens would then be regarded as a public utility as far as the supply of gas was concerned, but the sale of the coke would be left as it is now.

It is important that whatever form the control may take, it should not be of such a nature as to render industrial efficiency in the industries controlled any the less necessary, nor should it in any way curb individual initiative and enterprise. Control has not curbed individual enterprise in the Gas Industry—quite the reverse; nor can it be said that the Gas Industry is unremunerative, though it may not earn the huge profits that the coking industry did in its younger (much younger) days.

Distribution of Gas

The Author made certain general proposals in 1941 (*Trans. Inst. Gas E.*, **90**, 386), which still seem sound provided that the fundamental difficulties in the way of co-operation are removed. The proposals were that "the gas and coke oven industries together should set up a number of regional gas grids covering industrial areas. The purely residential and agricultural districts too far removed from a grid would be left to receive their supply from a local works as at present. . . . The provision of gas grids should not be regarded in a narrow spirit of immediate economics. The coke oven industry could assist in the development of these gas grids by centralizing production in very large units situated at convenient points for the distribution of gas and coke." It was pointed out that many of these possible grids had been examined favourably in 1934 (C. H. Lander and E. W. Smith, *Proc. Brit. Assoc.*, Section G, 1934). G. M. Gill has since pointed out that the area covered by the Ruhr gas grid is similar to that of England from Newcastle to Bristol. Clearly, such a grid would operate to the best advantage if coke ovens and large gas-works put gas into the grid, while all gas undertakings connected to it took gas out, the coke ovens and gas-works collaborating, as will be indicated later, in the sale of the coke.

A Central Carbonization Board

The Government encouragement of smoke abolition must mean a very great extension in carbonization. It will be necessary on the one hand to see that there is plenty of smokeless fuel available, and, on the other hand, to regulate production to ensure that existing equipment shall operate sufficiently near to capacity to keep costs down and so to keep prices reasonable and employment high.

Thus the case for some control such as a Central Board might impose may be summarized as follows:

(1) There will be a great increase in production required to meet the demand for smokeless fuel within the decade after the war; this may arise directly from Government action, and will in any event arise if the coke business is handled by both industries with the same energy as the sale of gas has been handled in the past.

(2) There is to be anticipated a great deal of construction and reconstruction after the war both at gas-works and coke ovens. Nearly all plants are in need of heavy repairs, extensions or re-building. This is an opportunity for planning which may never recur.

(3) The best site must be chosen for new plants. This site may be in large towns, at collieries, at the centre of gravity of a scattered population, or at a place selected for quite other reasons. The best site may not be chosen unless there is a planning authority.

(4) These plants should be of the right size having regard to the coals available, the cost of production and the demands for fuel in the neighbourhood. The usual colliery criteria of size—the amount of coal available or the capital available—should not be the governing factors.

(5) In order to make the right kind of coke it will probably be necessary to blend coals; the situation and layout of the plant should take this into account.

(6) To ensure that the price of coke oven gas is adequate, both industries should be under some form of statutory control. This control would fix prices on the basis of facts, and not of commercial bargaining.

(7) Under present conditions there might be in the future (*a*) needless over-construction of plant leading to over-production, unemployment and high costs, or (*b*) insufficient production of coke and gas—particularly of coke—to meet the demand. The avoidance of both these evils seems to necessitate planning by a central authority on the lines of the Central Electricity Board.

(8) At times it may—indeed will—be found that capacity is in

* From a Paper to the Midland Section, Coke Oven Managers' Association, Feb. 1, 1945.

excess of demand. It would be greatly to the benefit of all if certain plants were then put by agreement on a quota, others, better situated, kept on full output, and others closed down, the opportunity being taken for repairs, rebuilding, &c. In other words, the production throughout the industry should be regulated by the Central Board. Obviously there would arise certain financial arrangements to compensate those on reduced output.

(9) The supply of coke and gas to the various markets must be maintained and regulated. Stability on a long-term policy should be the objective, and old practices of diverting coke from one market whenever another offers better prices must be curbed in the interests both of the carbonizing industries and of the public.

(10) Since many of our best coking coals are getting near to exhaustion, there should be some authority to allocate the coking coals of the country to the uses for which they are best suited. Those coals that make the best metallurgical coke should not be used for the manufacture of domestic coke.

These points will not be elaborated here, other than to mention No. 6 briefly. In a recent Paper to the Wales and Monmouthshire Association of Gas Engineers and Managers, no doubt looking at the subject from the purely gas-works angle ("GAS JOURNAL," Oct. 4 and 11, 1944), the cost of making coke oven gas has been computed by making a balance-sheet of a plant carbonizing 1,200 tons, including the cost of coal, labour, management, &c., returns from residuals and coke, making no allowance for contingencies, loss of output due to bad trade, breakdowns, or other causes, and *allowing interest and dividends at 4½% on the bare cost of the installation without working capital.* Under these conditions the cost of purified gas into holder works out at 8.47d. per 1,000 cu.ft. It is held by critics that this method of calculation would not appeal to practical men with experience in the day-to-day operation of coking plants. No one would run the risk of erecting and operating a coke oven plant under these conditions. The coke oven industry is, financially, more hazardous than the Gas Industry, since there is no statutory guarantee of profits, which in effect is allowed to public utilities. The price of gas must make due allowance for this lack of stability, besides giving a reasonable inducement to industrialists to build carbonizing plant. There is here a striking diversity of views which seems to strengthen the case for setting up a central authority which could resolve these differences as seems best in the national interest, while paying due regard to the exigencies of industrial enterprises.

Efficiency in Utilization of Gas

In deciding upon the price of coke oven gas it must not be forgotten that the price at which gas can be sold must be taken into account just as much as the price at which it can be made. There have been many adverse views expressed upon the prices agreed for the South Yorkshire gas grid; but it must not be forgotten that gas (and coke) are in competition in industry with other fuels. The low price at Sheffield has created an enormous demand which could not otherwise have been secured. The user will compare the cost of making his products by gas with the costs when using other fuels, and will select raw coal, producer gas, coke oven gas, coke, water gas, oil or electricity according as best suits his conditions and purse.

Much can be done by improving the thermal efficiency of gas utilization. A great work was being done before the war by the Industrial Gas Centres, but the Fuel Efficiency campaign of the Ministry of Fuel and Power has shown that the inefficiency with which fuel was used in industry was almost unbelievable.

It must not be forgotten that while the gas and coke oven industries may increase the efficiency of gas utilization, those engaged in selling other fuels may do likewise. The conclusion, however, is clear; the coke oven industry, if it desires to sell gas on a large scale, must take part in a very much larger effort to increase the efficiency of gas utilization than has ever been made in the past. That is one vital step to obtaining better prices.

Attention may here be directed to Mr. A. E. Sylvester's views (Fuel Luncheon Club, October, 1944) that gas tariffs should be built upwards based on the cost of manufacture and service, and not downwards in the form of rebates for taking larger quantities.

Industrial Stability

For the maintenance of full employment, and to obtain an adequate return on capital, industrial stability is necessary. This has never hitherto been obtained in the coke oven industry. Its record between 1918 and 1935 shows marked insecurity; plants that were kept in operation throughout that period alternated between maximum and the bare minimum of output, while some works failed to stay in production. One of the objectives of post-war planning must be to obtain stability within the coke oven industry.

The Gas Industry in most areas is based primarily upon a domestic load, which is reasonably stable, and partly upon an industrial load which may be much less stable. By linking the coke ovens to the gas undertakings, increased stability will be secured. True stability depends largely, however, upon a long-term sound business policy, eschewing exploitation, and upon the success of the efforts made to sell gas and coke.

Increased domestic load means increased stability. To spread the industrial sales over as many industries as possible also promotes stability, since it is rarely that all industries are depressed at the same time. For this reason, centralization of production, with bulk distribution over wide areas, increases stability by increasing the diversity of the market and of the load. Plants attached to iron and steel works, and plants principally making metallurgical coke, are actually or virtually a part of the iron and steel industry, and their rate of production is governed by the stability of that industry.

Balanced Demand for Coke and Gas

It is equally important that the demand for coke and gas shall be reasonably balanced. The time may come when it will be possible to manufacture town gas by methods which do not involve the simultaneous production of coke; when that time comes the industry can itself balance production irrespective of demand. Those methods may well be based on the use of the poorest qualities of coal that would hardly pay for transportation so that gas will best be made at the pit-head; and that is another reason for starting now to link the coking industry with the Gas Industry.

The demand can be balanced to some extent by the use of producer gas for oven heating; when the price of coke oven gas is raised, this will become an economically sound proposition. The best method at present of balancing the demand is to sell more coke.

Lack of stability in the coking industry in the past has been admittedly due primarily to lack of stability in the demand for iron and steel. But apart from this, there has not been stability in other coke markets, an important reason being the methods that the industry has adopted for dealing with its coke business from a purely commercial aspect. The policy has been based on the fallacy of selling always in the highest-priced market. Stability of demand is more important than temporary advantages of a few pence or even shillings a ton. If, for example, coke is withdrawn from a group of users to supply another group that will temporarily pay more, is it likely that the first group will welcome coke back again and discard whatever fuel has replaced it whenever it suits the coke salesman to offer his coke again to that group? Oven coke has been mishandled by salesmen who have endeavoured to operate their business on the rise and fall of supply and demand in both British and Foreign markets, irrespective of the value of the fuel for any particular purpose.

If stability is to be achieved, the only possible method is to have an equal technical and commercial representation in both production and utilization, and to determine price structure by the results of technical work and development. Stability would thus be very largely achieved by technical effort, and the commercial development should in all circumstances follow in the same direction. Neither the commercial nor the technical sides should rule the position, but they should be equal partners.. In the oven coke business the commercial side has, hitherto, dominated the technical side.

Export of Coke

Although the export of raw coal is not considered generally defensible, the export of coke, being a manufactured product, is in principle expedient unless it interferes with the maintenance of the coke/gas availability ratio. It is not expedient that our best Durham furnace coke should be exported, for the coals from which this can be made are becoming seriously near to exhaustion. There are many coals that produce cokes of a metallurgical standard below the best Durham quality that are in sufficient supply to admit of export.

If it is decided to export coke, the arrangements for marketing coke abroad should be in line with those advocated for the home market. There must be close collaboration between all producers, and coke sales offices should be set up in each of the major consumer countries with a sufficient number of fuel technologists on the staff to assist the consumers to make the best use of their coke, and to seek for new outlets.

Here, too, the pursuit of industrial efficiency must be our objective. Our complacency has received a rude shock recently. We have been told, for example, that our coal and textile industries are hopelessly inefficient and therefore not competitive in world markets. True efficiency in any industry is composed of two factors. One is the efficiency with which each individual works is conducted; the other is the efficiency with which the affairs of the industry as a whole are conducted. While not neglecting the first factor, the second must have our urgent attention; its pursuit is the subject of this paper.

Carbonization and Chemical Manufacture

The products of coal carbonization can be used for major chemical manufactures not hitherto developed in this country. Among these are the production of oils and intermediates by the Fischer-Tropsch process; there have been considerable extensions of this process in Germany during the war. The production of ammonia, methyl alcohol and other substances has been practised in Belgium (for example) for years past. Other possibilities exist of using methane and ethylene, and of making carbide from coke.

These processes should be investigated. They cannot replace the use of coke and gas as fuels, but are a subsidiary outlet. A coke oven plant is as much a subsidiary to a Fischer-Tropsch plant as it is to an iron and steelworks. The chemical utilization of coke oven gas requires first a market for the products. It involves considerable capital expenditure and a full-time high-grade operating staff. If these

processes are to be profitable, therefore, they must be continuously operated at high output; in no sense can chemical utilization be an intermittent process for using spare gas.

Assuming that economic conditions are favourable, the erection of chemical factories of the necessary size would be aided by regional gas grids which could supply gas to these factories. The size of the factory would not then be governed by the size of the coke oven plant to which it was attached, nor would its rate of working require to be kept in line with the rate of gas or coke production.

Chemical utilization of coke oven gas must, therefore, be limited in scope by the markets for the products. It would not be an alternative to linkage with the Gas Industry, but an additional business venture to which both industries should contribute.

Research

The future of every industry to-day demands continual improvement —new products, better products, new processes, more efficient operation.

The coke oven industry should seriously consider whether its research association has been launched, or just given a push and told to float, if possible.

Is one-halfpenny per ton of coal carbonized considered too much to spend on research? On 20,000,000 tons that would bring in over £40,000 a year, apart from the D.S.I.R. contribution. That would provide a reasonable basis for real research. One halfpenny per ton is about 0.1% of the receipts from the sale of the products derived from by-product coking. Contrast the parallel expenditure on research in the U.S.A. (*cf. Industrial Research*, by Sir Harold Hartley, Fed. of British Industries): "Taking expenditure by individual American trades, we find the ratio of the research budget to gross sales is for radio apparatus 1.6%, for electrical communication 1.4%, and for the chemical industry and rubber products, 1%, though in the older industries the ratio is much less." What is the present ratio for the British Coke Research Association? A guess is between 0.01% and 0.025%.

Trade Associations

Coke oven owners are individualistic. Before the war it was not easy to persuade them to take joint action or to form a strong trade association. The war has forced all into the common pool, and the advantages of this have become manifest. The Government, moreover, will exercise greater control over industry in the future than it has in the past, and requires an organized body in each major industry with whom it can talk.

The trade association movement has made great strides in the past few years, and I would urge that there should be 100% membership of the National Federation of Coke and By-Product Plant Owners.

How far a trade association could undertake the functions suggested for a Central Carbonization Board is not clear; but at least it could discuss as a body with that Board any difficulties that might arise, and it would be the focus for common action in many of the directions mentioned in this Paper.

It is well to remind ourselves of the functions of trade associations:

I. *Technical.*

1. Standardization.
2. Pooling and interchange of patents.
3. Joint research—technical and market.
4. Service—advisory and consumer.
5. Education.

II. *External Relations.*

1. Carrying on discussions and negotiations with Government departments.
2. Giving evidence before committees of enquiry.
3. Making representations to various public authorities.
4. Holding exhibitions.
5. Publicity, including co-operative advertising.
6. Contact with industries and bodies having mutual interests.

III. *Commercial Functions.*

1. The control of prices.
2. The control of channels of distribution.
3. Regulation of output and market sharing.
4. The centralization of selling activities.
5. Bulk purchasing.

It is not proposed to discuss in detail the application of these functions to the coke oven industry. Not all of them are equally applicable. There is not as yet much scope for pooling and interchange of patients, for example. But the fact remains that regulation of the industry by the industry, coupled with co-operative selling of gas and coke (by-products are already dealt with in this way), and enabling some quota system to be put into operation when supply greatly exceeds demand, would be likely to lead to a very much easier situation if trade depression again overtakes us. Co-operative research and combined selling and publicity schemes are in great measure an insurance against trade depressions. The experience of the Coke Associations of the Gas Industry has shown the value of a trade association in the disposal of coke.

Conclusions

"An Englishman," said Bishop Creighton, "not only has no ideas; he hates an idea when he sees one." It is hoped that the ideas here put forward will meet with a better fate. It would take too much space to summarize all the suggestions made in this Paper, but a brief résumé of the main proposals may help to crystallize them.

(1) It is essential to develop our natural resources and to use them to the best advantage. In particular our coal position makes it essential for us to base our post-war fuel policy on the conservation of coal.

(2) There is every prospect of a very large increase in the consumption of smokeless fuel.

(3) The coke oven industry has never had commercial stability. The future must be planned with that objective in view.

(4) The coke oven industry is likely to be divided into one part which is owned by the iron and steel industry and supplies gas and coke to that industry, and another part comprising ovens not sited at metallurgical works and which principally supply coke and gas to other industries.

(5) To supply the nation adequately with smokeless fuel, the coke oven and gas industries should co-operate to a greater extent than they do now.

(6) Satisfactory co-operation appears to require Parliamentary sanction to remove certain difficulties.

(7) Regional gas grids supplied by gas-works and/or coke ovens would remove many technical difficulties of coke oven gas supply and assist the distribution of gas.

(8) Close technical and sales co-operation by all suppliers or producers of solid smokeless fuel is essential if the markets are to be developed to the fullest extent.

(9) Technical committees should be formed in the coke oven industry to investigate:

(*a*) The production of coke of the proper quality for domestic uses.

(*b*) The utilization of coke.

(*c*) The design of appliances, furnaces, &c., in which coke is used.

(10) Machinery must be set up to co-ordinate fully the work of the gas and coke oven industries, to maintain the highest pitch of industrial efficiency and to control production and distribution. As an example of what might be done reference is made to a possible Central Carbonization Board working on the lines of the Central Electricity Board.

(11) By-products should be developed to the fullest extent, including ethylene and methane. Tariff protection should be given to enable sulphur to be recovered at a profit.

(12) More money should be allocated to research.

(13) Relations with labour require consideration. A career in the coke oven industry should be made attractive to induce the best brains to enter the industry.

(14) A strong Trade Association comprising all coke oven owners is essential.

(15) The industry must obtain the highest efficiency within itself. A move towards that objective must start at the top. Confidence and bold development are needed; there is no room for a complacent belief that the existing order will serve in the changed post-war conditions. The carbonization industries have a great opportunity—but it requires to be grasped.

The Kitchen Planning Exhibition at Dorland Hall, London, was visited on the closing day (March 3) by the members of the Surrey Branch of the Association of Teachers of Domestic Subjects. They were briefly addressed by Mr. J. R. W. Alexander, General Manager of Associated Gas and Water Undertakings, Ltd.

The Third Edition of the *Steam Boiler Yearbook and Annual*, dated 1944, has made its appearance some months beyond the date appointed for its issue, publication having been delayed by war conditions. The policy of previous editions has been followed—*i.e.*, the first part of the book embodies a descriptive review of current practice in steam boiler engineering, while the second part contains a summary of the principal steam boiler Papers published during the past year. Part I now consists of 25 chapters, of which six are entirely new; two have been greatly extended, and the remainder have been revised as necessary to bring the volume up to date. One chapter reviews some recent developments; another gives useful information on gas firing; a long chapter examines the various designs of low water alarms and feed water regulators, while another is devoted to the important subject of the removal of boiler deposits. A book review section has been added to the new edition. Part II comprises chapters on fuel utilization, combustion appliance developments, feed water, steam, and fire-side problems, and modern practice and developments. Subjects dealt with include the utilization of low-grade fuel in Lancashire boilers, the selection of stokers for shell type boilers, reduction of induced draught fan erosion, a description of a 1,825 lb. pressure topping unit, and practical aspects of making expanded joints. The book is published by Paul Elek (Publishers), Ltd., Africa House, Kingsway, W.C. 2, at 30s.

Complete Gasification: Thermal Considerations

In the course of a Lecture to the North Staffordshire Fuel Society, Dr. J. G. King, Director of the Gas Research Board, said: Thermal balances and thermal efficiency in general have not, in my opinion, been studied nearly so carefully as they ought to have been, and it is often difficult to find in literature complete statements regarding the thermal efficiency of processes which are otherwise very well known. The overall thermal efficiency of a process is the percentage which the thermal value of the products bears to the sum of the thermal values of the raw materials used and of the heat and power consumed. This is by no means the whole story, however, and careful study of the heat of the reactions involved in the process and of the distribution of sensible and potential heat in the plant and in the reaction products is the best means of determining where heat may be escaping unnecessarily from the system. A study of this type should always be the first step in determining whether, and in what manner, any of the thermal losses can be prevented.

The simplest machine for complete gasification is the gas producer. The application of the results of thermal studies on a producer follows the lines of: (1) Reducing external losses by radiation; (2) maintaining a low O_2/H_2O ratio; (3) recovering heat from the hot gases and returning it to the producer. The first can be done by lagging, but other considerations may postulate a jacket boiler to produce the steam required. The second can best be achieved by superheating the steam/air blast. Theoretically, the best result would be obtained by superheating the blast to the temperature at which the producer gas leaves, the heat of reaction of the CO_2 formed balancing the radiation and other losses. A recent patent[1] has projected this proposal, that when producers are used in conjunction with furnace work the furnace gases should provide this necessary preheat. Alternatively, preheaters operating in the producer gas main would be a step in the right direction. The third improvement can be achieved in a variety of ways.

When the fuel used is coal, a water gas plant forms a system of complete gasification which has had some application in the United States of America, although not in this country. It will be apparent that the complete conversion of coal to gas in this way must be thermally more efficient than the separate production of coal gas and water gas. It may be calculated that the advantage is of the order of 12%. The calorific value of the gas, however, cannot exceed 350 B.Th.U. per cu.ft., which, unless the process is associated with the cracking of oil, is a limitation on the production of town gas which has hindered the development of the combined process in this country. By adopting a special cycle, the Fuel Research Station has gasified bituminous and sub-bituminous coals in a water-gas generator, realizing from the latter 210 therms of gas per ton, at 304 B.Th.U. per cu.ft.—*i.e.*, 64% thermal efficiency.

The combination has been effected in industrial plant[2] by superimposing a carbonizing chamber above a water-gas plant, burning the blow gas in chequer work round the carbonizing zone, and sweeping the distillation zone with the hot water gas. Examples of this procedure are the Tully and the Humphreys & Glasgow systems. The procedure in the Travers-Clark process is rather different, the blow gas being burned in a separate regenerator from which heat is carried by part of the gas made back through the coal, so effecting carbonization. In the Humphreys & Glasgow system the thermal efficiency of gas-making is represented by about 183 therms of gas at 350 B.Th.U. per ton of coal, or 57% including the fuel required for steam raising. A unit plant will gasify 10.4 tons of coal per 24-hour day.

In regard to the Tully system[2], which gives an overall yield of gas of the same order, possible improvements are the recovery of part of the sensible heat of the finished gas (4.6% at 250°C.), and of the waste gas (7.7% at 300°C.), by preheating the air. This might also give greater control over the reactions and reduce the loss of heat of reaction. A further possibility lies in improving cracking conditions so as to convert the tar to gas—*e.g.*, by returning it to the generator during the down run.

A variation of the combined process has been attempted in Melbourne by Broadhead.[4] The plant at Melbourne has been used mainly with brown coal, and it is interesting to find that the CO_2 content of the gas can be kept below 4%. The radiation loss is low considering that there are three generators, and the loss in ash is also low, but, since the plant does not embody a waste heat boiler, the losses in the blow gas are excessive. The heat content of this would be more than enough to raise all the steam required to supply the necessary power. The thermal efficiency of gas/coal achieved, excluding power and steam, is 62%, and is therefore some way below the maximum realizable for gas/coal including power and steam. The yield at present is 121 therms of gas per ton of brown coal, at 310 B.Th.U. per cu.ft.

German Processes

In Germany the development of processes for complete gasification[3, 5] has received more attention for three reasons: (*a*) The desire to utilize brown coal, (*b*) the production of CO/H_2 mixtures (synthesis gas) for the production of oil from coal, and (*c*) the more advanced use of industrial oxygen.

The processes which have reached industrial application fall into three classes:

(*a*) Those which involve heating by the recirculation of hot gases—*e.g.*, Pintsch-Hillebrand, Koppers, Wintershall-Schmalfeld.

(*b*) Those which involve an externally-heated reaction chamber—*e.g.*, Heller, Ahrens, Strache, Didier-Bubiag.

(*c*) Those which involve the use of oxygen—*e.g.*, Winkler, Lurgi-Drawe, Thyssen-Galoczy.

Of those in group (*a*) the Pintsch-Hillebrand can be taken as an example. Brown-coal briquettes are carbonized in a circular chamber 40 ft. high by 25 ft. diameter, and fall into a gasification chamber with a continuous ash-removal device. The base of the chamber is a regenerator in two sections, one half heated by externally generated producer gas. The gas from the carbonization zone is detarred, added to some of the water-gas from the gasification zone after the sensible heat of the latter has been used to raise steam, and recirculated with steam through the gasification zone *via* the other half of the regenerator. Using brown coal a generator gasifying 50/60 tons per day has produced 94 therms of gas per ton, at a calorific value of 260 B.Th.U. per cu.ft. and an overall thermal efficiency of 50%. The latter is low, and it is understood that it has been greatly increased in recent plants; 180 therms of gas per ton has been quoted.

The Strache process is similar in principle to that of Tully. The Ahrens process was specially designed to treat brown coal briquettes. The process does not gasify all the coal, and some coke is available for sale. Some process coke is also used for making producer gas to heat the chamber, and the steam for the water gas reaction is raised from the producer jacket. A typical thermal balance is as follows:

Fuel 100 :	
Gas	40.7
Tar	*Nil*
Benzole	4.6
Coke to producer	19.1
Coke sold	32.9
Loss	2.7

The efficiency of the process is low as a machine for total gasification, but is satisfactory (78.2%) as a carbonizing system. A unit chamber will gasify 10 tons of brown coal per day, giving 17,500 cu.ft. of gas at 505 B.Th.U.

The Didier-Bubiag process embodies a continuous vertical chamber oven, 30–35 ft. high, 13 ft. deep, and 12 to 14 in. wide, externally heated by producer gas. It is of more interest in this country since it has been designed to gasify not only brown coal but non-caking bituminous coal of small size (<2½ in.), preferably free from fines. One chamber will gasify about 7 tons of bituminous coal per day, producing 60,000 cu.ft. of gas per ton at a calorific value of 375 B.Th.U., and giving as by-products 10% of fine coke breeze, 5% of tar, and 1% of benzole. Coal enters the retort through an extra chamber on top which is heated by waste gases, where it is preheated or partly carbonized. It then passes downwards through the chamber (1,350°C.), while preheated steam (400°C.) ascends. The coke is not all gasified, sufficient being extracted to supply the gas producer; this is regarded as advantageous, since gasification to ash introduces difficulties into a carbonizing system. The main gas offtake is about one-third down the chamber, and part of the sensible heat of the gas (at 750°C.) is recovered in a waste-heat boiler. Any gas from the top chamber is added to the producer gas for heating the reaction chamber. When using brown coal, the CO_2 and water from the top stage of preheat are discarded to avoid diluting the gas.

This retort is relatively large for its output, but has had industrial success as a flexible means of making synthesis gas at an H_2/CO ratio of 2, with the minimum of difficulty. Although the overall efficiency is fairly high for a process of this type (68.7%), there is some opportunity for improvement. The heat lost as sensible heat of coke could be reduced by charging the hot coke to the producer, and a built-in producer might reduce the producer loss. The process is not self-contained as regards steam, but it is unlikely that more could be done with the residual heat in the flue gas or synthesis gas than to preheat the feed-water to the waste heat boiler or the producer jacket. The radiation, &c., loss from so large a chamber is satisfactorily low. The gas made contains rather a high proportion of carbon dioxide (11%); if this could be reduced to the monoxide the thermal efficiency could be improved considerably, but the H_2/CO ratio would be upset.

Processes Using Oxygen

The most spectacular advances in total gasification have been brought about by the use of oxygen, but this has been made possible only by the availability of by-product oxygen from synthetic ammonia plants which use liquefaction technique. If oxygen had to be made specially for the purpose, the cost would be much higher. The development of a fairly cheap oxygen plant for application in the Gas Industry is therefore one of our pressing problems, since the lack of a process is certainly holding up an important development. It is necessary to consider thermal as well as financial cost. The production of oxygen by liquefaction is as yet thermally inefficient (about 15%), and it should be understood that the thermal cost in power to produce 1,000 cu.ft. of oxygen under pressure is as high as 2.5 therms, as compared with 0.4 therm for the equivalent amount of oxygen in the form of low-pressure air.

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The war's not won yet.
So stick to your guns, War Savers
—we stick to ours."

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Of the oxygen-using processes developed in Germany, the Winkler and Thyssen-Galoczy operate at atmospheric pressure, using either oxygen or air enriched with oxygen, but much greater interest now attaches to the well-known process of Lurgi, which employs oxygen of a purity of 85% or more and is operated at the high pressure (for gas-making processes) of up to 25 atmospheres.

The Winkler producer is of the ordinary flat-grate type, and gasifies graded fuel of small size (0 to 5 mm.). Part of the blast enters at a high rate near the grate, and keeps the fuel "fluidized," and a secondary blast enters at a higher level. The blast may be air, air and steam, 50% oxygen and more steam, or pure oxygen and much steam. The necessary steam is raised by the sensible heat of the gas made. A standard generator of 8 to 9 ft. diameter will gasify 40 tons of coal per hour and produce about 48,000 cu.ft. of gas per ton at 305 B.Th.U. per cu.ft., with an overall thermal efficiency of about 77%, excluding power for oxygen production.

Very little is known of the Thyssen-Galoczy producer, but it is reported that, having no grate, it will gasify non-caking coal of any size and ash content at a very high rate, producing gas of a calorific value of 340 B.Th.U. per cu.ft., and at an efficiency of 90% including the recovery of the tar, which is reduced to 80% allowing for oxygen production.

Interest in the Lurgi or Lurgi-Drawe producer centres upon the fact that the rate of synthesis of methane increases with increase of pressure, until at 20 atmospheres' pressure, and under equilibrium conditions, the purified gas contains sufficient methane (about 22.6%) to bring its calorific value up to the normal town gas level of 500 B.Th.U. per cu.ft. The standard generator (about 50 sq. ft. cross-section) gasifies brown coal at the high rate of about 150 lb. per sq. ft. of cross-section of grate per hour, consuming 150 cu.ft. of oxygen and 70 lb. of steam per 1,000 cu.ft. of finished gas, and producing 185 therms of gas per ton at 450 B.Th.U. per cu.ft. Allowing for the preheating of steam and oxygen, the net yield is about 145 therms per ton. The overall efficiency of the process, 62.2%, is not high. The main reason for this is the exothermicity of the reactions by which 15.8% of the carbon of the fuel is converted to CO_2. The relatively low temperature of operation (500°C.) accounts for low radiation, &c., losses, and the difficulty of recovery of heat from the gas made, most of which is heat of condensation of water, available only at about 100°C. The process has probably reached the peak of efficiency, unless the course of the reactions can be influenced.

It would be most interesting to apply this process to British coals, and the Gas Research Board hopes to do this as soon as may be possible.

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The Gas Industry and its Operatives

The following is a summary of the discussion on the Paper by Mr. **J. H. C. Bates** to the London and Southern District Junior Gas Association—see "JOURNAL" of Feb. 14.

Mr. **W. K. Tate** (Distributing Engineer, Wandsworth) said that, as Chairman of the Board of Examiners to The Institution of Gas Engineers and a member of the Education Committee, he had had some contact with the Board of Education on the future of education in this country, and he felt that compulsory further education would be primarily of a general nature with a minimum of vocational training, since the intention was to broaden the general outlook of the student and prepare him for playing his part as a citizen of the future. There were at present some 113 technical colleges throughout England and Wales which provided vocational training, and it was surely best that such studies should continue at their present site rather than that they should be transferred to establishments which had little experience in operating them. There would seem to be a grave danger in introducing specialization at too early an age, and since Class "C" fitters could not be appointed until they were 21 years old, there would seem to be sufficient years available for training in craftsmanship between the termination of the further education and the reaching of man's estate, particularly as all this time youths would be at work on the district.

On the subject of recruitment, Mr. Tate felt that the nature of the duties on a gas-works and at holder stations precluded the appointment of youths, since, atlhough a youth could learn the work as quickly as a man, what was required was experience, physical development, and a sense of responsibility that came with mature years. With regard to the stove shop, there were excellent opportunities here for introductng young workers, and the opportunities were almost equal to those on the district. In the Wandsworth Company a grading scheme had been introduced with qualifications by examination at three levels, and appropriate rates of pay. As to the district proper, he felt that the term "gasfitter" was a good one, that it had become a household word and, therefore, dangerous to disturb, and that it was in no sense derogatory, since in industry generally a fitter was a highly qualified person.

Mr. Tate then turned to the question of regulations for gas installation work, and pointed out that Codes of Practice had been drafted by committees drawn from all over the country, and that these Codes were now in the hands of the British Standards Institution. There was no compulsion on any manufacturer or any purchaser to use British Standards, but if purchasers required them, gradually producers would be compelled to give them, and he felt that the same line of development would be followed in the Gas Industry. He was strongly of the opinion that it was not necessary to have a standard method of carrying out a particular job, but rather that the standard should relate to the materials used, position and siting of appliances, and general workmanship. He adopted the same standpoint on standardization of training, and viewed with some alarm Mr. Bates' scheme for introducing yet more committees into the operations of the Industry.

Mr. **Bates** said that although there were 113 technical colleges in England and Wales which provided vocational training, there was no doubt that the standards of instruction varied considerably. Since the examinations set were standard, there did not seem any reason against standardizing the instruction. In connexion with specialization, a fitter should not be interrupted in his gasfitting studies until he had passed the City and Guilds Final Grade Examination and the Grade A Test. By the time he reached this standard his knowledge would be considerable, and he would be more easily able to concentrate on the branches of installation work that required specialization. He considered that experience was gained to-day more quickly than it was years ago, and every encouragement should be given for men to qualify as first-class operatives at an early age, and thus enable them to reap the benefits of improved status and the remuneration that went with it. Generally speaking, there was not a demand for big numbers of youths at holder stations.

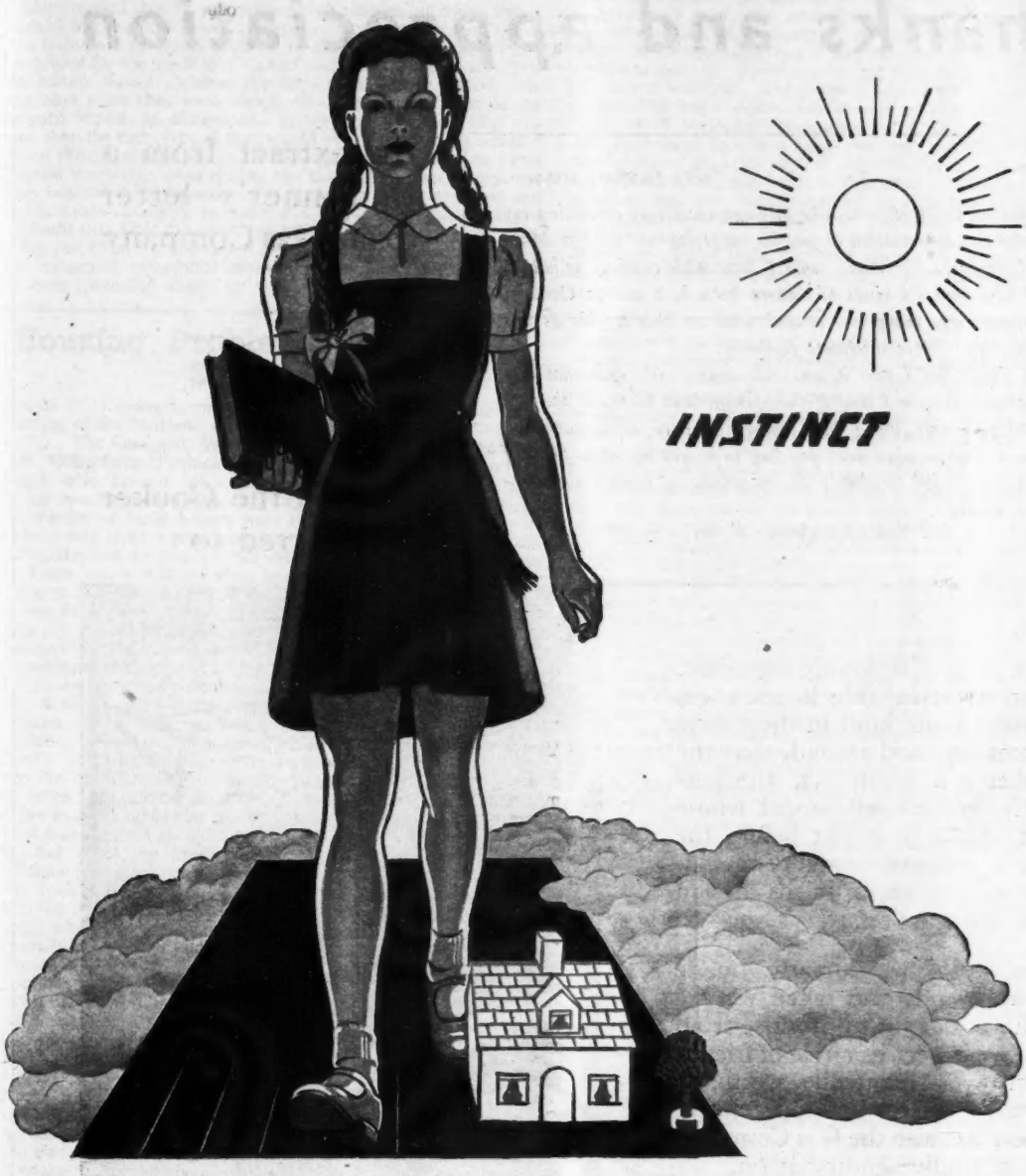
Mr. **R. N. Le Fevre** (Officer in Charge of Training, Gas Light & Coke Company) said he had spent some time recently studying other methods of training both in the Services and in other industries, and he was convinced that the whole success of any scheme such as that put forward by Mr. Bates depended on the provision of suitable instructors, and these were not easily found. Mr. Tate had said that there were some 113 approved centres for gasfitting courses in this country. From what he had seen as one of the chief examiners, Mr. Le Fevre was doubtful whether there were 113 qualified instructors. He endorsed Mr. Tate's remarks in regard to the Gas Installations Committee and referred to the various Codes of Practice. He noticed that Mr. Bates had not referred to reinstatement courses for men returning from National Service. His Company had prepared a scheme which followed very closely the scheme prepared by Mr. Tate for the Wandsworth Company. There were already some 100 men of his Company back from the Services, and reinstatement courses were starting forthwith.

Mr. **Bates** suggested that Mr. Le Fevre's remarks relating to the provision of suitable intructors further emphasized the need for standard methods of instruction. The wealth of experience that Mr. Le Fevre had of the conditions of training existing in the various training centres was positive evidence that instructional methods were most inconsistent. He was glad that Mr. Le Fevre referred to reinstatement courses for men returning from the Forces and National Service. This was a very important matter, and all undertakings must see that definite facilities were available for returning employees to have refresher and other training courses, and so prepare them for future operations in civilian life.

Mr. **H. J. Escreet** (Distributing Engineer, Gas Light and Coke Company) said the information obtained by The Institution of Gas Engineers with regard to the training accommodation available throughout the country was obtained primarily for the purpose of organizing refresher courses for men coming back from the Forces. It had not so far been possible to proceed very far with these courses because of the uncertainty as to the time when the war would end and the rate at which demobilization would take place. No doubt satisfactory arrangements would be made when the time came. Mr. Bates suggested that Central Installation Committees should be organized to deal with installation problems in the post-war period, and the training of personnel. These centres would appear to correspond to the Area Technical Development Centres which were proposed in the British Gas Federation Planning Report, and if these Centres were established the Installation Committees would not be necessary. He thought Mr. Bates had laid rather too much stress on regulations throughout his Paper.

Mr. **Bates** agreed that the institution of Technical Development Centres would, provided there were sufficient of them, obviate the need for further committees, provided that installation matters were dealt with by those actually responsible for the control of this work.

Mr. **C. A. Deas** (Tottenham and District Gas Company) said that Mr. Bates referred to training of boys to become retort house operatives. He himself was of opinion that there was no scope for boys in this type of work, which required a full grown man, who must be physically fit. Generally speaking, on the works as a whole boys were of little value except as apprentices on the machine shop and maintenance staffs. So far as operators for holder station control



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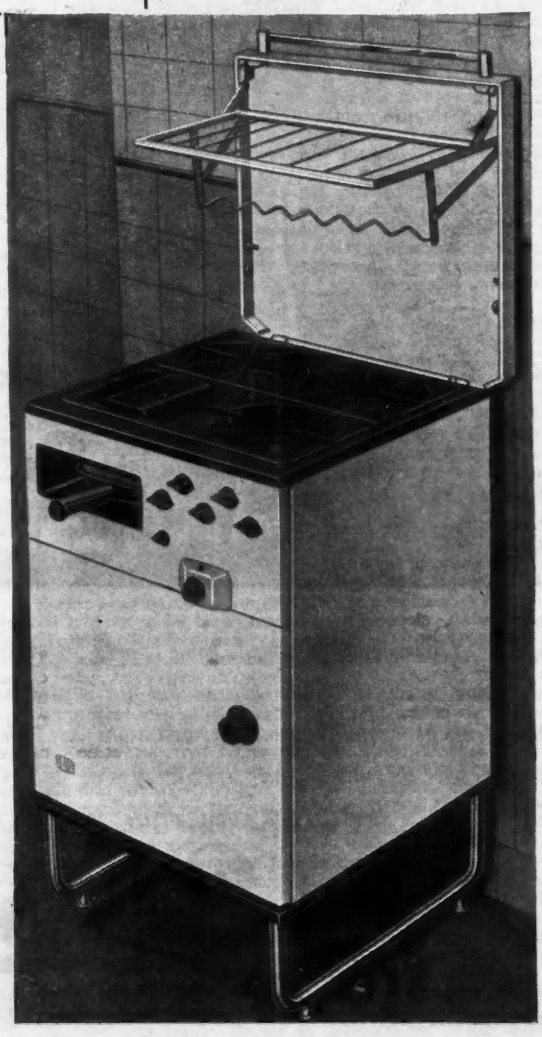
And the Cooker referred to



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were concerned, here again there was no scope for boys. He was interested in the Author's outline of what a man was required to know in order to qualify as a competent district fitter. He would like to know, however, whether Mr. Bates had any ideas as to the rates of pay these qualified men should enjoy.

Mr. **Bates** replied that he appreciated that physical strength was a fundamental of the retort house operative. If youngsters were introduced as trainees they would grow up in the works environment and learn to double for the many jobs—a fact useful in an emergency. The physical stature would come as the boys grew into manhood. By selecting boys when they were young, all complications of selecting mature men would be eliminated. If the right type of boy was recruited, then the right type of man would be produced. He omitted to mention fitters' rates of pay in his Paper in the knowledge that this point would inevitably arise during the discussion. Mr. Deas was obviously impressed by the amount of knowledge to be acquired and the qualifications necessary to become a first-class gasfitter. There was no doubt that after the war a revision must be made in the rates of pay for gasfitters, particularly if the Industry's operatives were to compare favourably with operatives in other specialist trades. Labour charges were inevitably linked up with installation costs, and if increases were to be made they would, under present conditions, be passed on to the consumer by increased charges for installation work. This was undesirable from the point of view of both the undertaking and the consumer, since it was a further hazard to the sale of gas. The installation of gas appliances had become a big section of a gas undertaking's work, and, apart from a small margin of profit, should not be regarded as a source of revenue, since the installation and supply of an appliance was a necessary feature in encouraging consumers to use gas. He was sure that high initial costs often resulted in a loss of business. The future policy of selling appliances and gas installations was a matter which requires very careful consideration.

Mr. **W. F. Pritchard** (Tottenham and District Gas Company) said he agreed about increased wages proving the greatest incentive to the recruitment of the right type of operative, also that specialized training of juveniles for gas-works carbonizing staff was unnecessary. He would suggest that, having induced the right type of juvenile to enter the Industry to train as a gasfitter, they should be further encouraged by payment of a special scale, under the Regional Agreements, to all those who passed their City and Guilds Examinations as they fell due. This scale to be an addition to the age group scale now in force.

Housing Problems and Gas Service

Problems of Housing in reference to Gas Service were discussed at a meeting of the Midland Junior Gas Association in Birmingham on Feb. 15. The President, Mr. **F. J. Bengough**, was in the Chair.

Mr. **W. Wilberforce** (Fittings Superintendent, Wolverhampton Gas Company), who opened the discussion, pointed out that he was voicing his own opinions. Prior to the last war, he said, it was the general practice to build houses with a reasonably sized kitchen in which the family lived a great proportion of their time. Then came the kitchenette, and the dining room with a cooking range fitted in the latter. There was a strong feeling against this arrangement, and it gave place to an ordinary grate in the dining room; in many cases no cooker was fitted in the house at all. This, of course, was of great assistance to gas undertakings, and if the builder could be made "gas minded" and would install gas cookers, it meant that the whole of the cooking was by gas.

What, he asked, is the position to-day under the suggested types of houses? A workroom kitchen with an additional utility kitchen and dining-room annexe and possibly a lounge. Is the whole of the ground floor, he went on, to be sacrificed to the kitchen, the woman's workshop? From illustrations of model houses does not the kitchen resemble the corridor of a hospital? Is there much homeliness in feeding in an annexe close to cooking smells and heated by a duct from a fire in some other room? Are these homes or merely houses? While the Gas Industry would be satisfied if it obtained the cooking, heating, hot water, and refrigeration equipment in these houses, were all these appliances necessary?

If they took a look in the cooker cleaning shop of any gas undertaking in the country, what would be the general opinion formed of the people who had sent cookers in? Were they the type of people who generally looked after and cared for the appliances it was suggested should go into new homes? And was there any real saving, especially from a maintenance point of view, in having all fittings concealed, and all openings filled with cabinets and cupboards?

Appliances that went into new houses should be easily accessible; attention should be given to auxiliary hot-water supplies for summer time, and when the solid fuel boiler was not in operation; adequate flues should be in every room whether solid fuel or gas fire was installed; if a refrigerator was to be supplied it should be of a size that was worth while.

And what of the millions of existing houses, hundreds of thousands of which had a black, unpacked, and unsightly gas cooker? There were thousands with old-fashioned solid fuel boilers, every one of which was waiting for the electrical salesman to call. He felt there was a need for kitchen equipment, including cookers and refrigerators, on the unit principle which could be offered to consumers on advantageous terms.

Mr. **F. A. C. Pykett** (Distribution Engineer, Coventry) said the City Architect of Coventry estimated the post-war requirements of Coventry were in the region of 50,000 dwellings. If this could be taken as typical of the country as a whole, it was obvious that some hundreds of thousands of dwellings would be required to meet the demand. The City Architect, Mr. D. E. E. Gibson, in conjunction with Radiation Ltd., had designed a prefabricated house which appeared to have many advantages over the usual type of brick-built house, in addition to that of speed in erection. Mr. Pykett enumerated the materials embodied in the structure, and gave details of the accommodation. Hot water for domestic purposes and for heating during the cold periods was provided by means of a special grate using solid fuel fitted in the corner of the living room. Much study and research had taken place before the details of this house were finally decided on.

In kitchen planning generally he favoured four things: Firstly, the oven and hotplate should be fitted at eye level, as well as the refrigerator; secondly, all gas-consuming appliances should be grouped together and the products of combustion as well as cooking steam and odours removed by mechanical ventilation; thirdly, too little attention had been devoted to the use of scientific kitchen furniture; fourthly, the production of a domestic dish-washing unit was sadly lacking. Washing up was the bugbear of every meal. The housewife spent 40% of the time in the preparation of a meal, 20% in eating it, and another 40% in washing up. The first 60% mentioned might be attractive; the other 40% took all the joy of the meal away.

One heard little about private enterprise these days. It was all Government circulars and municipal enterprise, but before 1939 80% of the houses were built and sold by private enterprise, and he was sure that these conditions would return. It was up to the Gas Industry to cater for these people. It must be prepared to assist people by returning to its methods of showmanship and salesmanship.

Mr. **A. Hill** (New Buildings Inspector, Birmingham Gas Department) pointed out that Government policy after the last war proved an incentive to Birmingham to embark on a big housing programme. This was done, and up to the outbreak of the present war over 52,000 houses had been completed by the Corporation. In these days they were accustomed to "thousands of millions," and 52,000 houses did not seem many. But if these houses were set up continuously on either side of a road they would extend for more than 100 miles—nearly the distance from Birmingham to London. The land used for the houses was approximately one-eighth of the area of the whole city, and the population housed equalled that of a town of the size of Plymouth. The Birmingham Council's post-war programme aimed at providing 30,000 high standard houses in the shortest possible time. The first year's programme aimed at 5,000 houses despite the immediate shoratge of skilled labour and certain materials, and in addition the slum clearance programme was to be pursued by comprehensive redevelopment schemes involving up to 50,000 replacement dwellings, built for the most part in the area now occupied by the condemned houses. That would take 20 to 30 years. The houses required to meet wastage and population increase would normally be provided by private building.

The **President** said the Coventry houses were very attractive, but he would like to see the same kitchen after a meal for, say, five had been taken!

Mr. **F. A. Reynolds** (Wolverhampton) said from his experience the cutting out of the utility kitchen and the enlargement of the working kitchen was a great improvement.

A Booklet has just been issued which is in the nature of a quick reference to the maintenance of industrial boiler plant. The booklet (No. 38) is the most recent of the Fuel Efficiency Bulletins issued by the Ministry of Fuel and Power.

The Dundee Town Council has agreed to grant the request for the services of Mr. James Dickson, Gas Engineer and Manager, from the Directors of the Cardenden, Lochgelly, and Kelty Gas Companies. This request was in connexion with proposals made by the Ministry of Fuel and Power, and Mr. Dickson has been requested to report on the valuation of plant and equipment of each of the three gas-works.

A £20,000 Scheme to lay a new high-pressure gas main ring around part of Belfast has been approved by the City Administrators. Mr. J. L. Hyslop, Engineer and Manager, reported that gas distribution mains throughout a greater part of the city, many of which were laid from 40 to 60 years ago, were of insufficient capacity to deal with normal output, with the result that for some years past it had not been possible to maintain in outlying districts the pressure of gas during periods of peak demand. He stated that the contemplated housing developments would, when carried out, make additional demands on the service and aggravate the difficulty. He was of opinion that the most economical means of providing an adequate supply would be to lay a new high pressure ring main around part of the city. The estimated cost of the work would be about £20,000, for which it would be necessary to secure borrowing powers. The Administrators approved of the proposal, but deferred consideration of the question of making application for sanction to a loan pending negotiations in regard to the route to be followed.

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Products Prices—Stocks and Shares

The London Market Mar. 12.

As from March 5, by the Coal Tar Products Prices Order, 1945 (S. R. & O. 1945, No. 229), the maximum price of Pitch for briquetting has been increased to 60s. per ton f.o.r. supplying works, and the prices for Road Tar, as fixed by the Coal Tar Products Prices Order, 1943, S. R. & O. No. 1528, have been increased by one half-penny per gallon. There is also an increase of 5s. per ton in the price of standard Creosote/Pitch Mixture.

The prices of other products are unchanged.

Control of Benzole and Coal Spirit Order, 1944 (S.R. & O. 1944, No. 172), is in force.*

By this Order the price of Motor Benzole is fixed at 2s. per gallon. The Order also lays down the method of evaluating Crude Benzole, and calls for periodical returns to the Ministry of Fuel and Power from all producers of Crude and Refined Benzole.

Control of Toluene (No. 4) Order, 1944 (S. R. & O. 1944, No. 170), contains an amendment of the Control of Toluene (No. 3) Order, 1943.

There is also the Control of Benzole and Coal Spirit (No. 2) Order, 1944 (S. R. & O., No. 988).

Coal Tar Products Prices (No. 2) Order, 1944 (S. R. & O., 1944, No. 1051), allows increases in the maximum prices for all forms of Naphthalene.

* Slightly amended by Control of Benzole and Coal Spirit (No. 2) Order. 1944.

The Provinces Mar. 12.

The average prices of gas-works products during the week were : Pitch and Crude Tar,* Toluole, naked, North, 90's, 2s. to 2s. 2½d., pure, 2s. 9d. (now controlled by S. R. & O. 1944, No. 988, operative from Sept. 1, 1944. Benzole and Coal Spirit, also Coal Tar Naphtha and Xylole, are now controlled by the Control of Benzole and Coal Spirit Order, 1944, dated Feb. 18, 1944, S. R. & O. 1944, No. 172, operative from March 1, and S. R. & O. 1944, No. 988, part 1, operative from Oct. 1, 1944, Carbolic acid, 60's, anthracene, creosote oil (hydrogenation), coal tar oils (timber preservation, &c.), and strained anthracene oil controlled by the Coal Tar Products Prices Order, 1943, dated Oct. 20, 1943 (S. R. & O. 1943, No. 1528), operative from Nov. 15, 1943, Naphthalene now controlled under S. R. & O. 1944, No. 1051, operative from Sept. 22, 1944.

Attention is called to a new Order, Coal Tar Products Prices Order, 1945 (S. R. & O. 1945, No. 229), referred to on p. 305, "JOURNAL" of March 7.

* In regard to pitch and crude tar prices we would ask readers to refer to the editorial note on p. 396 of the "JOURNAL" for Sept. 10, 1941.

Scotland Mar. 10.

Deliveries are proceeding at a regular pace. Price of Road Tar is increased by ½d. per gallon. Refined tar*: Yield to distillers is 5d. per gallon *ex* Works, naked. Creosote oil: Timber preserving quality,* 5½d. to 6½d.; hydrogenation oil,* 5¾d.; low gravity or virgin oil,† 7¼d. to 7½d.; benzole absorbing oil,* 6½d. to 8d. per gallon. Refined cresylic acid* is 3s. 6d. to 4s. 6d. per gallon *ex* Works, naked, according to quality. Crude naphtha†: 6½d. to 7d. per gallon. Solvent naphtha*: Basic prices delivered in bulk, 90/160 grade, 2s. 8d., and 90/190 Heavy naphtha, Unrectified, 1s. 10½d.; Rectified, 2s. 2d. per gallon. Pyridine†: 90/160 grade, 13s., and 90/140 grade, 15s. per gallon.

* Price controlled. † Uncontrolled.

The strength of the gilt-edged section was the chief feature in the stock markets last week, although there were several good lines among industrials.

There was a steady volume of business in gas stocks and shares. All movements in price were in an upward direction, and mostly confined to fixed-interest issues. It will be noticed that the majority of debenture stocks now give a yield of about 4%.

The following prices were changed during the week:

PROVINCIAL EXCHANGES

Bristol Ord.	119—120	+½
Derby Cons.	132—137	+2
Newcastle Units	26/3—26/9	+-/6d.
Sheffield (*x.d.*)	147½—149½	Feb. 26

OFFICIAL LIST

Associated Gas & Water 4½ p.c. Red. Cum. Pref.	21/—22/—	+-/6d.
Bombay	41/6—43/—	+-/6d.
Brighton Cons. (*x.d.*)	104—109	Mar. 5
Croydon 5 p.c. Deb.	123—128	+1
East Surrey 5 p.c. Deb.	124—129	+4
Mid-Southern Utility 4 p.c. Pref. ...	101—104	—
Primitiva Holdings Ord.	12/—14/—	+1/—
South Metropolitan Ord.	92—95	+1
South Suburban 5 p.c. Pref.... ...	112—117	+2
Ditto 5 p.c. Deb.	123—128	+2
Tottenham 5 p.c. Pref.	110—115	+2
Wandsworth 5 p.c. Deb.	123—128	+1

SUPPLEMENTARY LIST

Brighton 5 p.c. Deb....	122—127	+1
North Middlesex 5 p.c. Pref. ...	110—115	+2
Slough 5 p.c. Deb.	122—127	+2
Uxbridge 5 p.c. Deb.	122—127	+2

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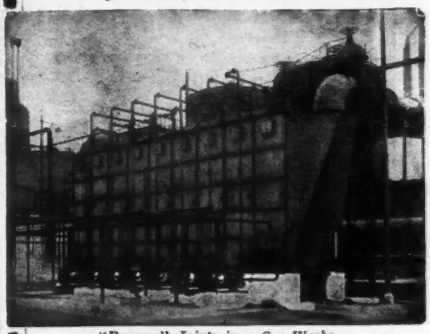
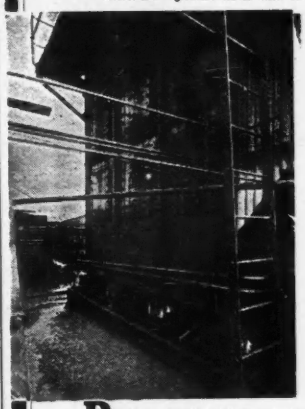


"Permac" Joints in a Gas Works.



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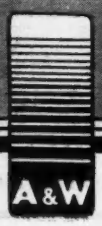

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APPLICATIONS are invited for the position of SHIFT SUPERINTENDENT at the Crowlands Gas-Works. Present Salary £300 per annum plus War Bonus.
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The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination.
Applications, stating Age, Experience and position with regard to National Service Acts and Essential Works Orders, together with *copies* of two recent Testimonials, endorsed "Shift Superintendent," to be delivered to Jno. L. Anderson, Acting Gas Engineer and Manager, 91, Eastbank Street, Southport, not later than Saturday, March 17, 1945.
Town Hall, R. EDGAR PERRINS,
Southport. Town Clerk.
February 22, 1945.

MAINTENANCE FITTER

REQUIRED for Gas-Works an experienced MAINTENANCE FITTER with good knowledge of Gas-Works plant and machinery, and capable of general repairs to Gas and Steam Engines, Exhausters, Pumps, Compressors, &c. Apply in writing, stating Age, whether married or single, Experience and position under Essential Works Order. Wages paid will be 2s. 0½d. per hour.
Gas-Works, Maidstone. W. A. HOWIE,
February 27, 1945. Engineer and Manager.

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APPLICATIONS are invited for the position of INDUSTRIAL GAS ENGINEER, at a salary of £375, rising by annual increments of £15 to £420, plus cost of living bonus, at present amounting to £49 11s.
Candidates must have a sound experience in the design, installation, and maintenance of Industrial Gas Equipment, particularly of central heating and bakers' oven installations with automatic control equipment, and the conversion of such installations from solid fuel to gas.
The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a Medical Examination.
Applications, giving Age, full Particulars of Training, Experience, Present Position, and Qualifications, and stating position under the Essential Works Order and in regard to Military Service, and endorsed "Industrial Gas Engineer," are to be sent to the undersigned, accompanied by *copies* of not more than three Testimonials, not later than 9.0 a.m. on Thursday, March 29, 1945.
Corporation Gas-Works, JOHN W. PALLISTER,
Commercial Street, M.Inst.C.E., M.Inst.Gas E.,
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Applicants should not be over 40 years of age.
Applications, stating Age, Training, Experience, Present Occupation, position regarding Military Service and the Essential Work Order, together with not more than three recent Testimonials, should be addressed to the undersigned, and delivered not later than Thursday, March 22, 1945.
11, Houndgate, H. HOPKINS,
Darlington. Town Clerk.

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The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and the person selected will be required to pass a medical examination. The appointment will be terminable by three months' notice on either side.
Candidates should state the period of notice required to terminate their present appointment, and their position in regard to Military Service and the Essential Work Orders.
Applicants should have experience in gas for domestic, commercial and industrial purposes, development of high and low system of distribution, and possess the Higher Grade Certificate of the Institution of Gas Engineers in Gas Engineering (Supply).
Applications, stating Qualifications, Experience, Age, &c., and accompanied by *copies* of not more than three recent Testimonials, must be delivered to the Gas Engineer (D. V. Lewis), Gas Offices, Bloom Street, Salford, 3, Lancs, not later than the first post on Saturday, March 31, 1945, the envelope to be endorsed "Distribution Engineer."
Canvassing directly or indirectly will be a disqualification.
Town Hall, Salford, 3. H. H. TOMSON, Town Clerk.

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Applications, stating position under National Service and Essential Work (General Provisions) Order, and giving full particulars of Age, Training, Experience and Qualifications, with *copies* of three recent Testimonials, to be received by the undersigned not later than Wednesday, April 11, 1945.
Town Hall, Bradford. N. L. FLEMING,
March, 1945. Town Clerk.

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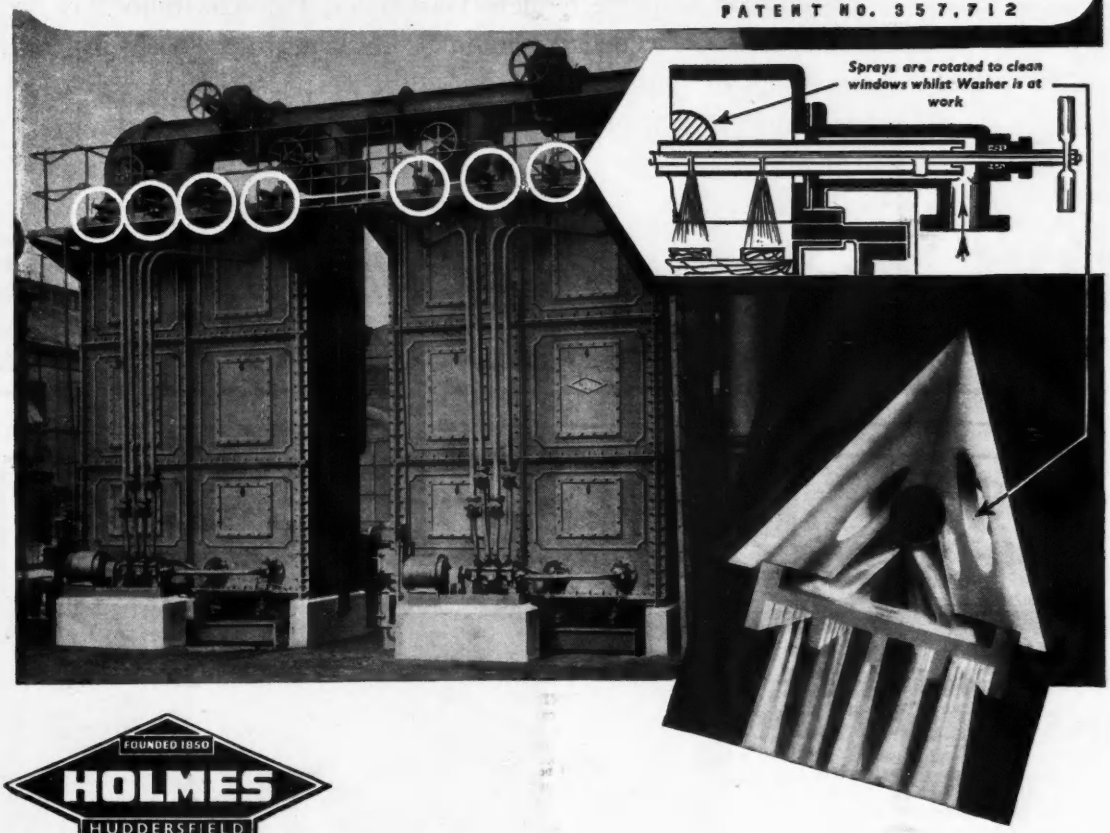

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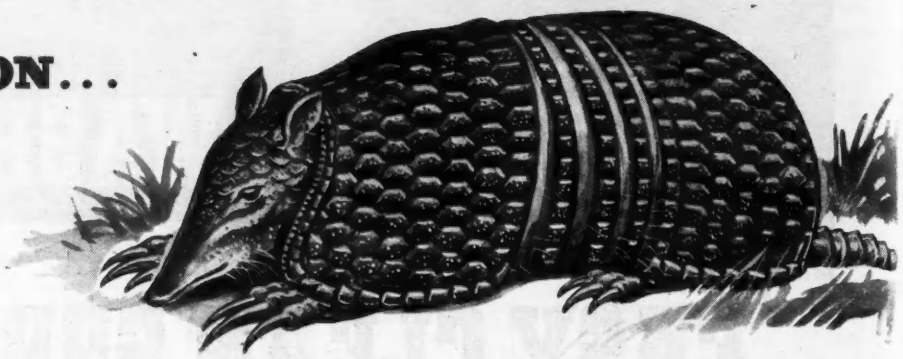

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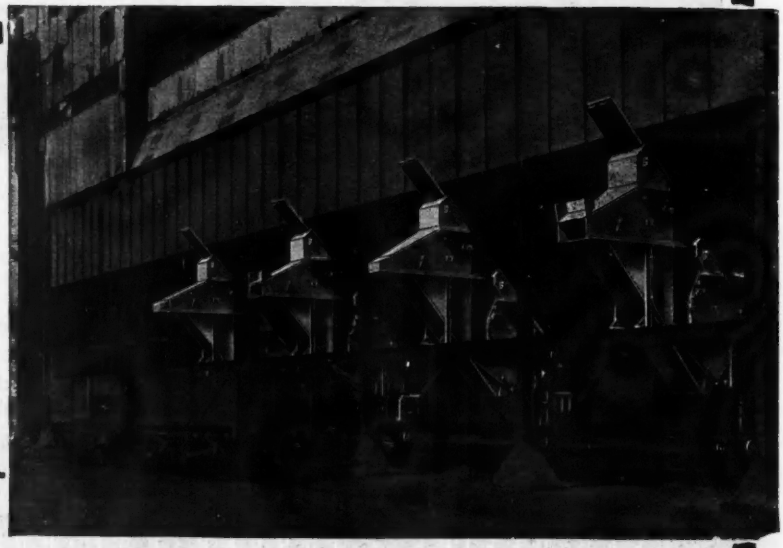

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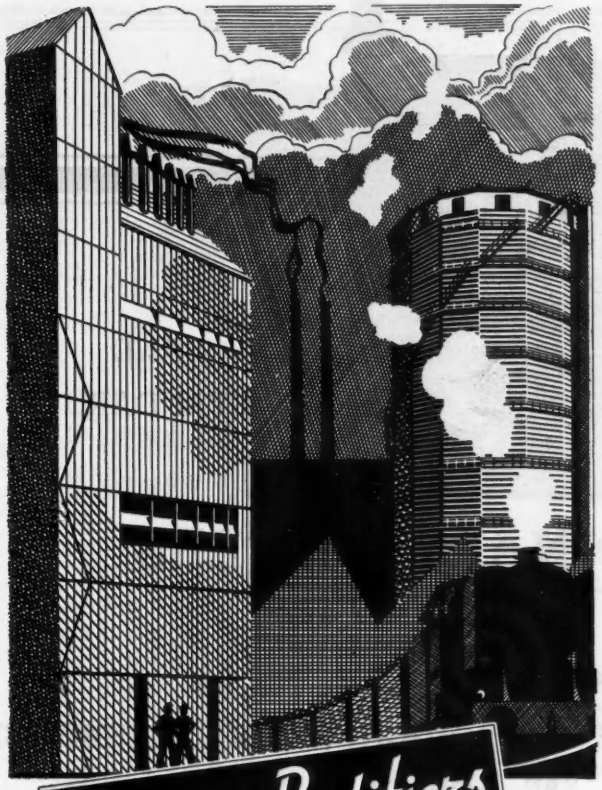

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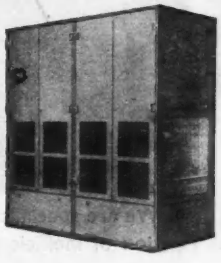

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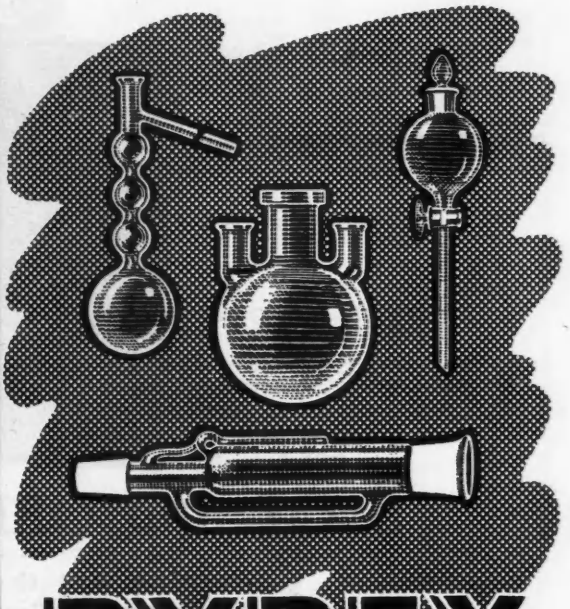

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PYREX Brand Scientific Glassware has irrefutable claims that place it in the front rank of all such glassware . . . . resistance to sudden thermal changes, resistance to attacks from acids (except hydrofluoric and glacial phosphoric), and ample mechanical strength to resist the physical shocks of everyday usage.

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PYREX Brand Scientific Glassware is supplied only through Laboratory Furnishers, but illustrated catalogue and two free copies of our Chemist's Notebook will be sent direct on application to us.

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HIGH CAPACITY

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SLOT AND ORDINARY METERS

Nothing But the Best Materials and Workmanship Used in Their Manufacture
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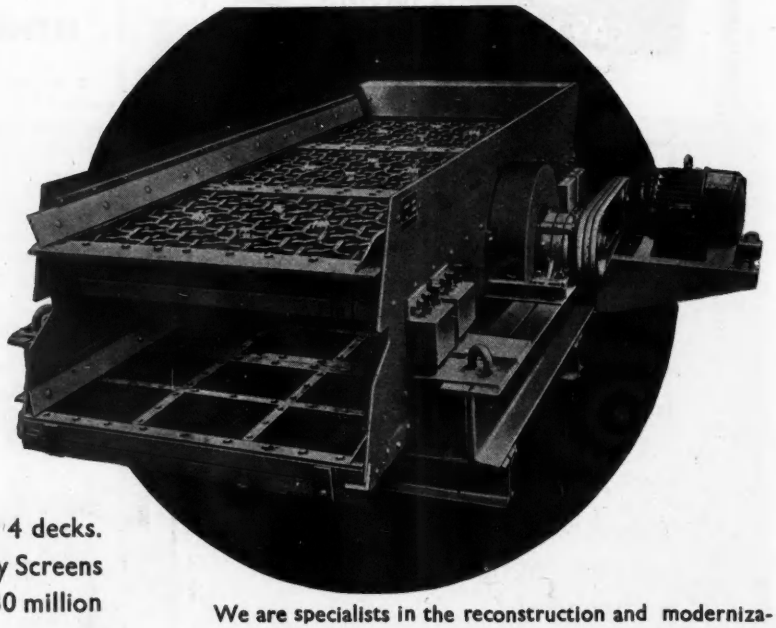
give maximum grading efficiency, from run-of-mine to slack, by their high speed, positive and very lively vibratory action. The screens are precisely balanced, mechanically operated, and are supplied as self-contained and totally enclosed units, with 1, 2, 3 or 4 decks. The capacity of "Niagara" Vibratory Screens for the coal industry alone exceeds 30 million tons per annum.



We are specialists in the reconstruction and modernization of inefficient or inadequate screening installations

The fullest information and all details gladly supplied against enquiry.

NIAGARA SCREENS (Gt Britain) LTD
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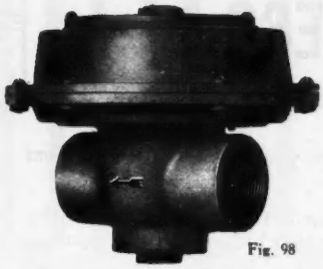

Fig. 98

With compensated valve inlet pressures to 5 lbs.

First in 1866 and First ever since

Every consumer who uses gas for lighting or heating should have a Peebles Service Governor installed on his premises.

Only when a governor is used is it possible for constant correct pressure to be maintained at the meter or appliance burners. When this correct pressure is obtained gas appliances function at their highest efficiency: maximum light or heat is obtained for the least consumption. Peebles is the Pioneer of Service Governors—famous since 1866. Specify "Peebles Service Governor."

Peebles

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are made in two patterns—Mercurial and Diaphragm—in all standard sizes. Ask for "Service Governor" list.

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Speaking of pressing a button and getting the work done! Into the air and along it goes—just as easy as that. Three models available: Minor, Major and Mammoth—all built for continuous heavy duty. Overhead runways erected if required.

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HYGIENIC CLEANLINESS . . .

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. . . STERNOCLEANSE prevents dermatitis. It keeps your workpeople free from industrial skin troubles easily, quickly and economically.

STERNOCLEANSE IS NOT A "CLEANSER"—it is an antiseptic emollient cream which is rubbed into the skin before work, forming an imperceptible but impervious "glove."

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Use Sternocleanse No. 1 for protection against paint, grease, oil, tar, filings, etc.
Use Sternocleanse No. 2 for protection against soluble oils, spirits, chemical and water-wet solutions.

Sternocleanse

SKIN SCREEN AGAINST DERMATITIS

Packed in cases containing 12 × 2-lb. tins, 6 × 7-lb. tins. Also in 28-lb. and 1-cwt. kegs.

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ALSO
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Patentees and Sole Makers

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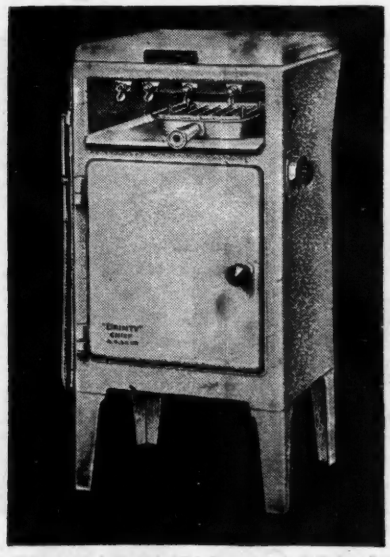

Streamlined modern design, cast iron construction and many other special features—notably economical consumption of gas.

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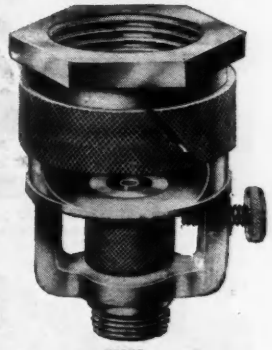
Modern Industrial Practice
WILKES APPLIANCES

VARIABLE, low pressure patent
GAS & AIR INJECTORS
Provide INSTANTANEOUS ADJUSTMENT for subnormal pressures

WILKES patent Gas and Air Injectors solve the problem of varying gas pressures. Made in six sizes for ½-in. to 2-in. burner connections, the consumption range is 15 to 250 C.F.P.H. In B3005, illustrated, the smaller milled ring controls the gas volume, and the larger (split) milled ring controls the air supply.

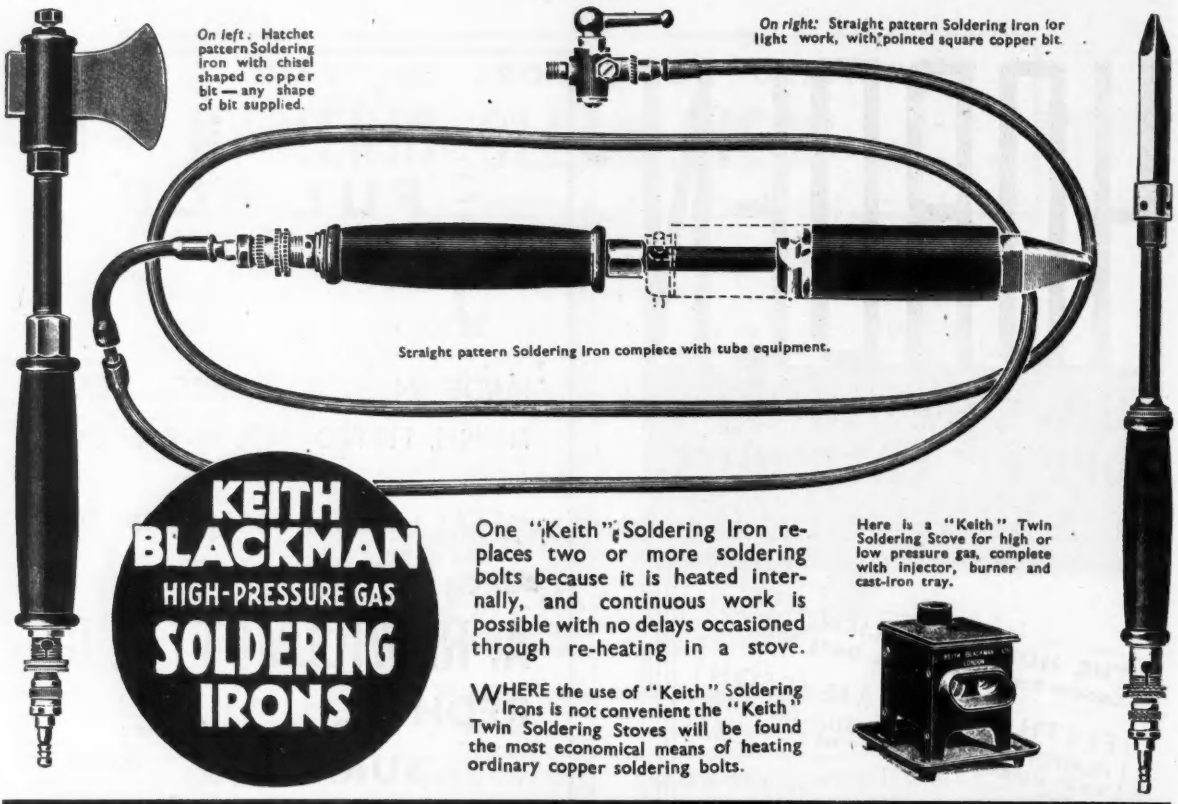


B3005

A. H. WILKES & CO.
A subsidiary of William Allday & Co., Ltd.
38 G. J. PARADISE STREET, BIRMINGHAM, 1
Telephone: Midland 4804/5/6 Telegrams: Yadall, Birmingham

On left: Hatchet pattern Soldering Iron with chisel shaped copper bit — any shape of bit supplied.

On right: Straight pattern Soldering Iron for light work, with pointed square copper bit.



Straight pattern Soldering Iron complete with tube equipment.

KEITH BLACKMAN
HIGH-PRESSURE GAS SOLDERING IRONS

One "Keith" Soldering Iron replaces two or more soldering bolts because it is heated internally, and continuous work is possible with no delays occasioned through re-heating in a stove.

WHERE the use of "Keith" Soldering Irons is not convenient the "Keith" Twin Soldering Stoves will be found the most economical means of heating ordinary copper soldering bolts.

Here is a "Keith" Twin Soldering Stove for high or low pressure gas, complete with injector, burner and cast-iron tray.

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DERBY, ENGLAND

Driving and Conveyor Chains of the best quality; made of Ley's Celebrated Blackheart Malleable Iron.

ALSO COMPLETE CONVEYORS AND ELEVATORS

COMPRESSORS & EXHAUSTERS
FOR AIR AND GAS.

See our Advertisement Next Week.

REAVELL & CO. LTD. IPSWICH.

YES
A POWERFUL ROBUST SELF-SUSTAINING WINCH

Smallest wall space, side or front driving also special types, including multi division barrels, combined horizontal and vertical operation, etc.

Used Largely for Black-out Shutter Operation

WINCHES

Also used for Blinds, Electric Lighting Fittings in Halls, Hotels, etc. Dampers, Curtains, Laundries, Steamer Lids, Hospitals, Street Lighting, A.R.P. Clothes Racks, Hoses, etc.

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UPLANDS 4871/2

NO
RATCHETS, PAWLS, SPRINGS or GEAR WHEELS

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ADRIAN AVENUE, NORTH CIRCULAR ROAD, N.W.2

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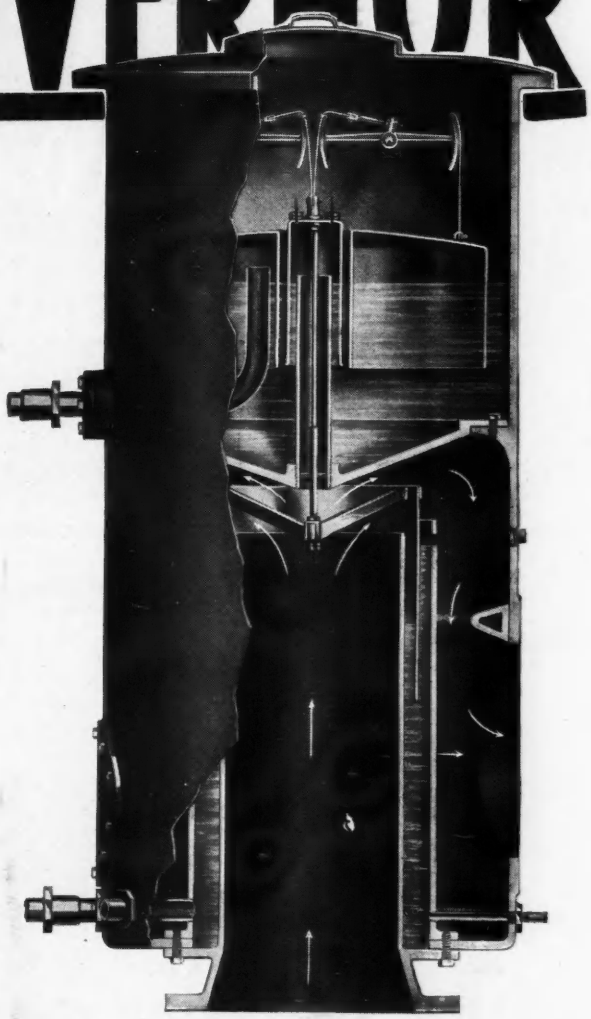
B·K VACUUM GOVERNOR

Patent No. 395,443

BETTER CONTROL OF CALORIFIC VALUE AND CONDITIONS IN RETORTS WITH REDUCTION IN MAINTENANCE COSTS



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INSULATING
BRICKS, RECUPERATOR
TUBES, SPECIAL SEMI-SILICA
QUALITY FOR SEGMENTAL RETORTS
WITH NO EXPANSION OR CONTRACTION AT 1400° C

Manufacturers of
Fire Bricks, Lumps & Tiles
OF EVERY DESCRIPTION

PUMPS
FOR GAS WORKS

PLEASE APPLY FOR
LIST NO. 8D.

FIG. 57A. IRON CAST LIFT PUMP.

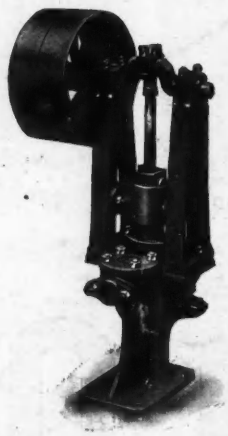

FIG. 257. BELT DRIVEN SINGLE GUIDED RAM PUMP, FOR 60 LBS. PER SQ. INCH.

TRADE MARK
LION

FIG. 62. GALV. SHEET STEEL LIFT PUMP

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